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ABSTRACT

A transactional theory which views interpersonal behavior as being communicated simultaneously on 3 channels was tested. Forty dyadic groups were composed which ranged from compatibility to incompatibility through all possible combinations on the 3 channels. The groups tested the hypothesis that there would be a linear relationship between intra-group compatibility and a set of 5 dependent variables. Each of the dyads was scheduled for a half-hour discussion period in which members worked together to solve a case study problem. Following the discussion sessions, each member completed a post-meeting test instrument. Results of 3 of the linear relationships were in the predicted direction; the fourth set of data provided conflictual results; and the fifth set of data gave results not supportive of the theory. (Author/RS)

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Final Report

Project No. 144-C663
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A THREE CHANNEL MODEL FOR ANALYSIS OF COMMUNICATION

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ABSTRACT

Forty dyadic groups were composed for an experimental study designed to test a transactional theory which views interpersonal behavior as being communicated simultaneously on three channels. The dyadic groups ranged from compatibility to incompatibility through all possible combinations on the three channels. The dyads were identified from a battery of instruments administered to 200 subjects. The general hypothesis was that there would be a linear relationship between intra-group compatibility and a set of five dependent variables. Each of the 40 dyads were scheduled for a half-hour discussion period in which the members worked together to solve a case study problem. The sessions were video taped. Following the discussion session each member was given a set of post meeting instruments to complete. Results on three of the linear relationships were in the predicted direction. The fourth set of data provided conflictual results. The data on the fifth dependent variable gave results which were not supportive of the theory. The results, although highly encouraging, demonstrated the necessity for further delineation of the methodology in the testing of the theory.

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SECTION 1
INTRODUCTION

There is sufficient empirical evidence to conceptualize the communication networks of small face-to-face groups as being composed of three simultaneously operating channels. The three channels have been identified as the *motivation*, *delivery* and *information* channels. Basic concerns are expressed through the *motivation* channel. The manner in which an utterance is delivered in a group is here referred to as the *delivery* channel. The cognitive system of an individual in a group setting is here identified as the *information* channel. The three channels are more fully described in the section entitled Theoretical Framework.

It was reasoned that the motivation channel would have the greatest weight in small group transaction. This was based on the argument that basic concerns (socio-psychological tensions) must be handled first before an individual can clearly perceive and deal with either the delivery or the information channel. It was further argued that were the motivation channel free of disturbance the delivery channel would be next in importance. Delivery styles disrupt a communication system more readily then does information even if the information were also repulsive to the listener. Another way to view this is if the information were acceptable to the listener the noise of a perceived negative delivery style would seriously disrupt the information messages from being heard. Thus our argument proposed a hierarchy of the three channels.

To operationalize this conjecture it was proposed that a procedure which would establish degrees of compatibility be employed. Accordingly, it was proposed that the higher the compatibility in any one channel a decreasing amount of noise would be observable in the transactions. For example, were two members of a group highly compatible on the motivation channel they would be more able to direct their attention to the other two channels. Further, if they were also compatible on the delivery channel they could then direct their full attention to the information channel. In this manner it would be argued that persons compatible on the motivation and delivery channels would transact more on the information channel than would individuals who were not compatible on these channels. This statement represents in gross terms the conjecture that was proposed and tested.

Since a large number of variables compose the transactions of a small face-to-face group a design was proposed to restrict the significance of those factors which did not directly bear on the problem at hand. Accordingly an experimental design was developed composing dyad groups having various degrees of compatibility on the three independent variables, namely, the motivation, delivery and information channels. Thus it was possible to compose dyads with all three channels highly compatible progressively to dyads where all three channels were highly incompatible. By means of such a design it was believed to be an empirical study to test the conjecture that there exists an hierarchy among the three channels.

SECTION 2
STATEMENT OF THE PROBLEM

The problem which was investigated may be more readily understood through a discussion of previous research which served to more clearly delineate the scope of the study.

There are many variables and combinations of variables which have been identified and investigated in the study of small groups. Some researchers have focused their attention on the input variables. These studies are concerned generally with personality, basic needs, or psycho-dynamics of group members. Many of these studies have been able to demonstrate that such variables may be accountable for sizeable proportions of the variance of group behavior (Hare, 1962). Other studies have investigated the interpersonal communication styles of group members. These studies have been able to show evidence that part of the variance can be consistently explained by the pattern of the communication styles (Schein and Bennis, 1965). There are studies which have examined the exchange of information and the communication channels as variables in the life of small groups. Such studies have also found meaningful and statistically significant results (Bales, et. al., 1958). Finally, there is a growing body of knowledge about relationships between outcomes and the transactions of groups (Collins and Guetzkow, 1964).

It is not difficult to realize that a paradigm which could encompass the three phases, input, operation and outcome, should prove to be a very powerful instrument in the study of small groups.

The first question that may be raised is: Do individuals act during the interaction session of a group in the manner indicated by a pre-meeting measure? Hare (1962) concluded after a review of the literature that, "although it is evident that the variety of behavior which has been predicted from paper-and-pencil or projective tests generally support the hypothesis of an underlying consistency in behavior, the evidence is not all positive."[1]

---

[1] Hare, p. 180.

The conflicting evidence which Hare reports on the consistency between pre-meeting and interaction measures may be due in large part to the use of one system of personality attributes upon which to predict behavior and another system of interaction categories to test the consistency hypothesis. This explanation may explain why Borgotta and Eschenbach, (1955) found no significant relation between Rorschach scores and behaviors scored by Bales' categories. In previous research, Fouriezos, Huth, and Guetzkow (1950) were able to demonstrate significance between Rorschach scores and such behavior categories as dependency, dominance, aggression, etc. Thelen and associates (1958) studied group-relevant aspects of personality and found a high correlation between a pre-session measure (RGST instrument) and behavior during group meetings (observation data). Both sets of data were based on the same category system.

Although the statistical results were supportive of the consistency hypothesis the obvious variance continued to raise questions. Breer (1960) found that preinteraction measures of the subject and the other person with whom the subject was to interact was superior to a measure based on attributes of the subject alone. The extensive work carried out by Schutz (1955, 1958) provided much support to this further refinement of the consistency hypothesis. The consistency hypothesis was upheld by the work of other researchers (Haythorne et. al., 1956a, 1956b).

The significance of the work of these investigators went beyond their contribution to the consistency hypothesis. It is clearly evident from their work that the consistency hypothesis and the interaction hypothesis (one can only describe a group as it interacts) are incorrectly viewed as conflictual. In the study and description of small groups they are complementary.

Our knowledge of groups has long since led us to know that personality is only one major component of a study of small groups. From the classic experiment of Lewin, Lippit and Whyte (1960) the students of small groups have been very much concerned with leadership styles and subsequently interaction styles of group members (Fox, 1957; Ziller, 1957; Hare, 1953). Ben-Zeev (1955) was one investigator who most clearly differentiated personality and interaction style. It should be clearly understood that personality and interaction style are dynamically related but do not come in predestined counterparts.

The work of Stogdill (1959), Leavitt (1951), Guetzkow (1960), among others, has been directed towards the consideration of the information exchange among members. The significance of such research findings have found direct application in a variety of settings from business to family counseling.

In very brief terms the above material identified three time phases: input, operation and outcome. In the following material three components concerned in all three time phases are identified as being basic components in the life of any small group. These are personality of members, interaction styles members employ, and the information members bring and exchange.

The importance of any one of these components cannot be questioned in the face of our accumulated knowledge. The stage of our progress should be at the investigation of the interrelationships among these components. To this end this investigator proposed the following paradigm as a basis for the study.

The study was conducted within a defined conceptual framework. In brief terms it may be conceptualized as a transactional model. Figure 1 presents schematically the basic components of the model. A group can be viewed as an input, operation, and output system. This dimension is shown at the top of the figure. A group at the same time can be viewed as having three channels in its communication system. Specifically, these are the motivations (psychological needs an individual brings to a group); delivery (the manner in which individuals relate to others); and information (the knowledge individuals have at their disposal).

Channels	Phase Components		
	Input	Operation	Outcome
Motivation			
Delivery			
Information			

FIGURE 1
Conceptual Model for the Analysis of
Interations of a Small Group

The major problems that the study investigated were:

1. Does the paradigm provide the means by which to explain the behaviors within groups and the post-meeting perceptions of group members?

2. Does the paradigm provide the means by which to predict specific patterns of interpersonal behaviors?

3. Does the paradigm provide the means by which to predict specific patterns of intermation-exchange behaviors?

4. Does the paradigm provide the means by which to predict the post-meeting perceptions of group members?

It was believed that the findings could have great potential on developing means for more meaningful communication within the duties of social workers, educators (teachers, councellors, administrators, etc.), and indeed most facets of business, industry, and government. The information could apply to small groups as well as dyads.

Hypotheses

There are three channels operating in the communication networks of group members. The three channels have been described in the Theoretical Framework Section of this report. They were identified as the motivation, delivery and information channels. Although all three are essential, the conjecture was that there exists a hierarchy among the channels. Specifically, compatibility on motivation is more essential for productive communication than compatibility on delivery style which, in turn, is more essential than the compatibility of information.

In order to state specific hypothesis to test the general conjecture it was necessary first to describe the hierarchy of compatibility among group members and then to provide the dependant variables employed to examine the effects of the various hierarchical groupings.

The most specific and workable type of group at this stage of the theory appeared to be a two-man group (dyad). The structure of these groups was determined by a systematic patterning of the three variables, motivation, delivery and information.

To avoid a lengthy description of the composition of these groups they are described symbolically in quasi-mathematical formulations. All groups are dyads. Let x stand for one member and y represent the second member. The symbols M, D, and I stand for the motivation, delivery and information channels respectively. The notation $\equiv$ means that there exists a high measure of compatibility between the two members, while the notation $\not\equiv$ should be interpreted to mean a low measure of compatibility. Definitions of high and low levels of compatibility are presented in the design section of this report.

TABLE 1
HIERARCHICAL ARRANGEMENT OF THE TYPES OF DYADS FORMED BY SYSTEMATICALLY PATTERNING THE COMPATIBILITY OF THE MOTIVATION, DELIVERY AND INFORMATION CHANNELS

1. $M \equiv M$
$D \equiv D$
$I \equiv I$

2. $M \equiv M$
$D \equiv D$
$I \not\equiv I$

3. $M \equiv M$
$D \not\equiv D$
$I \equiv I$

4. $M \not\equiv M$
$D \equiv D$
$I \equiv I$

5. $M \equiv M$
$D \not\equiv D$
$I \not\equiv I$

6. $M \not\equiv M$
$D \equiv D$
$I \not\equiv I$

7. $M \not\equiv M$
$D \not\equiv D$
$I \equiv I$

8. $M \not\equiv M$
$D \not\equiv D$
$I \not\equiv I$

The two variables of sex and age were controlled in the composition of all dyads. Thus a group was either two males or two females. All groups were composed of members who do not differ more than five years in age.

The general conjecture is stated in the following terms:

There exists a hierarchy among the three channels of communication being that the compatibility on motivation is more essential than the compatibility on delivery which in turn is more essential than the compatibility of information.

From the conjecture hypotheses were developed. The hypotheses are operationally testable statements. As such they are phrased by means of the methodology and instrumentation developed within the theoretical framework. Descriptions of the procedures and the data gathering instruments are presented in the design section which follows and also in appendix B.

The hypotheses are:

1. The dyad types will be ordered from 1 through 8 on the congruency of the pre and post semantic differential tests at a significance level $\overline{>}$ .05.

2.a. If $M \equiv M$ and $D \equiv D$ and $I \equiv I$ then the group members will show a statistically significant ($\overline{>}$.05) preference for describing the group as a work group.

2.b. If $M \equiv M$ and $D \equiv D$ but $I \not\equiv I$ then the group members will not show a statistically significant preference for describing the group in terms of any one channel. ($\overline{>}$.05)

2.c. If $M \equiv M$ and $I \equiv I$ but $D \not\equiv D$ then the group members will show a statistically significant ($\overline{>}$.05) preference for describing the group in terms of the D channel.

2.d. If $D \equiv D$ and $I \equiv I$ but $M \not\equiv M$ then the group members will show a statistically significant ($\overline{>}$.05) preference for describing the group in terms of the M channel.

2.e. If any two channels are not congruent then the group members will show a statistically significant ($\overline{>}$ 05) preference for describing the group in terms of the M channel.

3. The dyad types will be ordered from 1 through 8 on the analysis of the information test such that the groups will be differentiated significantly on:

   a. statements indicating joint development of decisions
   b. statements made by himself during the meetings

c. statements made by other member during the meetings

d. statements made by other member during the meeting but for which he assumes authorship

e. statements not made during the discussion period

As the analysis progresses from dyad type 1 to dyad type 8 there will be a progression from a to e.

4. There will be patternings of motivational behaviors such that there will be in evidence

a. a higher level of trust
b. less conflict with autonomy
c. more acceptance of initiative
d. a greater feeling of adequacy
e. a greater clarity of ego identity
f. more acceptance of intimacy
g. more intense generativity
h. a higher level of integrity

on the part of groups 1, 2 and 3 over group 5, and groups 4, 6, 7 and 8.

5. Where the measure of compatibility is high between dyad members, there will be high positive supportive behaviors in the emotionality categories. As compatibility progressively decreases, there will be a progressive trend toward high negative non-supportive behaviors.

TABLE 2
RELATIONSHIP BETWEEN HYPOTHESES AND DATA GATHERING INSTRUMENTS

Hypothesis	Data Gathering Instruments
1	Semantic Differential Test
2	Post-Meeting-Reaction Q Sort
3	Information Test
4	Observation of Ego-Stage Concerns
5	Observation of Emotionality

SECTION 3

THEORETICAL FRAMEWORK

The interaction paradigm with its compound of phases and communication channels, has been presented in general terms in the previous section. This section contains the operational definitions and a full description of the theoretical framework. In view of the shortcomings of certain previous investigations a set of four criteria were established that would serve as the minimum requirements for any set of categories developed for and employed in the study.

(1) First, the categories must meet the criterion of continuity for the three phases. That is, the pre-experimental, experimental, and post experimental tests must seek complementary data on the three phases of input, operation, and outcome.

(2) Second, the categories must be theoretically compatible among the channels employed in the proposed interaction paradigm. That is, one must not use one theory in relation to motivation and a different theory in relation to the information channel, and still another in relation to delivery styles.

(3) Third, the categories must allow for direct conceptualization of variables between individual and group. That is, one cannot talk about ego psychology of individuals along with a group theory which does not allow getting back to the discussion of the individuals. (Davie, 1970)

(4) Fourth, the categories must be submitted to those criteria to which all operationally defined categories must yield. First, the inclusiveness and exclusiveness criteria are demonstrated in the definitions of the categories presented in the appendix to this report. Secondly, the reliability and validity criteria are dealt with in the design section of the report and supplementarily in Appendix B.

Motivation Channel

Language serves us as a means of working on our basic concerns. Basic concerns may be conceptualized in any one of a number of motivation systems. The ego identity conceptualization for many reasons appears to be a most productive system and it is that system which is employed in the present design. (Boyd and Koskela, 1970).

Before proceeding to the operational definition of the categories, it may prove helpful to examine what is meant by the motivation dimension in less esoteric terms. An examination of one's own experiences in inter-personal relations may prove instructive. As you listen to and watch a person talking to you, you begin to perceive certain content receiving more attention, more emphasis. The content may appear openly in the surface flow of his conversation. It may appear just as frequently in a less open manner, coming to the fore in his interpersonal interactions with this word or that gesture. For example, your acquaintance may be telling you about his work-a-day experiences and running through his accounts are consistent threads of an identifiable condition of mistrust towards his fellow workers. If mistrust is a basic concern of this individual then this psychological content would be expected to appear in a predominate number of situations. Anyone who observes others, or indeed if it is only to interact with others, employs categorization to simplify the situation in order that reactions may be made. We use that information which we are free to use and which is at our disposal.

The most elaborate and operational statement of ego identity as a genetic life-span system has been given by Erik Erikson (1959, 1963) in a series of clear and brilliant writings. In these writings Erikson has presented a synthesis of ego structures and functions which extend Freud's theory of psycho-sexual development (1910) and the work of Hartmann (1958, 1964) in the processes of the ego. The ego is seen as a developing part of personality in its own right. Ego development is assumed to take place in a systematic fashion in combination with libido developmental processes and general maturational processes. Erikson divided ego development into eight stages. He postulated that each stage is focal to a certain chronological period of life and that at each of these periods the developing ego faces a central problem or crises. Havighurst (1953) who gives credit to Erikson has developed a similar rationale under the rubric "developmental tasks." These categories have proven to be to some extent culturally bound while those of ego psychology have been demonstrated to apply to cultures in general (Mead, 1928) (Erikson, 1945) (Kluckholm, 1948).

Figure 2 is an epigenetic diagram of the eight ego-crises. The figure is to be read from the bottom left corner diagonally to the top right corner. Each diagonal cell should be connected and read in correspondence with the period which appears at the left margin of the figure. For example, the ego-stage, autonomy vs. shame and doubt, is connected to and read with the muscular-oral chronological period.

The cells ascending diagonally from the botom left corner to the upper right corner contain the progressive sequence of ego-stage (psychosocial) crises. Each crises (except trust vs. mistrust as this is the initial set) ". . . exists in some form before the time it becomes 'phase-specific,' i.e., when 'its' psychosocial crisis is precipitated both by the individual's readiness and by society's pressure."[1]

At the "phase-specific" period each crisis comes to its own ascendancy and, ". . . finds its more or less lasting solution at the conclusion of 'its' stage."[2] Following the ascendency phase of an ego-stage the solution of the psychosocial crisis becomes an integral force and structure in the developing solutions of the subsequent ego-stage crisis. These are the post-stage phases and appear in the horizontal cells to the left of the "phase-specific" cell. These cells are employed to identify the secondary crisis in the interdependence of a previous ego-stage crisis and the 'phase-specific' ego-stage crisis.

The cells to the right of a 'phase-specific' ego-stage crisis identify the genetic relation the crisis has to previous ego-stages at the time when they are 'phase-specific.'

The instruments based on ego-crisis theory which were administered in the study are described in the design and a appendix section of the report.

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[1] Erik Erikson (1959). p. 119.
[2] Ibid.

	I	II	III	IV	V	VI	VII	VIII
VIII Maturity								Ego Integrity vs. Despair
VII Adulthood							Generativity vs. Stagnation	
VI Young Adulthood						Intimacy vs. Isolation		
V Puberty & Adolescence					Identity vs. Role Confusion			
IV Latency				Industry vs. Inferiority				
III Locomotor-Genital			Initiative vs. Guilt					
II Muscular-Anal		Autonomy vs. Shame, Doubt						
I Oral Sensory	Basic Trust vs. Mistrust							

Figure 2

Eight Ego-Stage Crises*

*Erikson, Childhood and Society, p. 273

Delivery Channel

The second content component in the communication channel is here referred to as *delivery*. An utterance may be spoken of as being delivered one of a wide variety of manners. For example, the word 'no' may be spoken sternly, questionably, laughingly, firmly, or mildly. The meaning of the word can be significantly altered by the way it is delivered. It has been commonly observed to have heard an individual remark: "It is not so much what he says that irritates me, but the way in which he says it." Another similar remark that may be heard during a break session of a group is: "There is something in John's manner that just rubs me the wrong way." Style of delivery has long been a concern for students of speech and drama.

The delivery dimension on the communication process may be studied by an examination of a subject's speech patterns, or by his gestures and mannerisms, or a combination of all these behaviors. Through such studies it should be possible to describe an individual's delivery style and it should also be possible to develop explanations of the particular patterns which may be discerned in the study. This study was to carry out on the basis of a set of criteria that stated conditions that all three channels of communication must meet. The second criterion is of central consideration at this juncture. The criterion states that the categories must be theoretically compatible among the three levels or channels of the communication model. Thus the system of categories employed for the delivery channel must be conceptually within the ego psychology category system employed at the motivation level. The category system initially suggested by Bion (1960) and subsequently modified and extended by Boyd and his associates (1969) meets the requirement of the second criterion.

There are two content aspects in delivery style, work and emotionality. Work aspects of group operations are defined as "the consciously determined, deliberate, reality-bound, goal-seeking aspects of the group's activities."[1]

There are four levels of work. A full operational description of the levels is present in Appendix A of the report.

---

[1] Stock and Thelen, p. 13-14.

1)	Level I	Personal Need-Oriented
2)	Level II	Housekeeping Need
3)	Level III	Active Problem Solving
4)	Level IV	Creative, Insightful, Interpretive

The emotionality aspects of group operation have been defined as ". . . Non-purposive, 'instinctual,' and not under conscious control."[1] There are six types of emotionalities or emotional status.

1. Fight: statements expressing hostility or aggression.

2. Flight: statements expressing avoidance or withdrawal.

3. Pairing: statements expressing warmth, intimacy or supportiveness.

4. Counter-pairing: statements expressing desire for formality, aloofness, or non-intimate involvement.

5. Dependency: statements expressing reliance, need for authority.

6. Counter-dependency: statements expressing concern over threat to autonomy.

The instruments which are employed at each of the three phases are described in the Appendix B of the report.

Information Channel

The exchange of information serves the adaptation system of the individual. To make "reality bound" decisions it is necessary to have the essential information. In this sense the information exchange channel may be viewed as a feed-in and a feed-back of information between or among individuals.

There are three types of components which are feed-in and feed-back through the information channel. One is the content. Content may be described as the subject matter, the object, event, topic, thought, etc. which is being examined and exchanged. The second component is the cognitive processes which are employed to carry forth the inquiry. Such processes as differentiating, structuring, integrating and abstracting are included within the cognitive component of the information channel. The third component is the encoding-decoding component or aspect.

---

[1] Ibid.

Bales identifies three aspects of an act. He states that "every act involves some characteristics which we can abstract and call cognitive, some characteristics we can abstract and call affective, and some we can abstract and call conative." (p. 52) These he subsequently denotes as adaptive, expressive, and instrumental.

The argument here is that the adaptive system handles more than the cognitive aspects of communication. It is necessary for an individual to handle the problems of adaptation dealing with all three channels in the communication network, namely, motivation, delivery, *and* information.

It is further argued that the expressive has two components, the motivational and the delivery channels. We often agree with the basic concerns of other members in a group but oppose the manner in which these basic concerns are being delivered.

In addition to the above two criticisms of Bales' categorizations of acts, the narrowness of his definition of the instrumental component or aspect is also rejected here. The position taken here is there are three aspects to the instrumental. These have been described as the content aspect, the cognitive aspect, and the encoding-decoding aspect.

The most significant disagreement this study has with all the recognized interaction categorization systems both in education and in social psychology is their *failure to recognize and to gather data on the expressive and instrumental aspects simultaneously*. It is recognized that the approach taken in this study is now made possible by the previous work of these researchers and the great strides that have been made in the technology of social science research. It is because of these advances that it is well within our resources and abilities to move forward to the type of research which was undertaken in the present study.

The focus that this study took can be described as being within the encoding-decoding component of the information channel. Participants were requested to identify the flow of contributions and the source of their origination. A full description of the means by which these data were gathered is given in the design and appendix sections of this report.

One of the important contributions that this study made was to simultaneously analyze the information channel in association with the motivation and delivery channels.

SECTION 4
DESIGN

The design of the study consisted of three phases. The phases were sequential and are described in the following sub-sections.

Pre-Experiment Session

In the first phases, a large number (248) subjects were given two batteries of tests. These subjects were selected from classes of undergraduates on the University of Wisconsin (Madison) campus and represented several disciplines. Numerous professors were asked if they would allow the researchers to visit their classes briefly, explain the project, and ask their students to participate. The students who agreed to participate were requested to complete the batteries of instruments. Neither the exact nor general hypotheses being investigated were revealed to any subject before the completion of all data gathering.

The description, reliability, validity, and scoring of all the tests used in this research project are explained in Appendix B.

Battery 1, Motivation Channel: This battery contained two instruments, both providing data on the motivation dimension of the subjects. The first instrument is entitled *Self Description Questionnaire* (SDQ) which is designed to gather information on the self perception of a subject in terms of ego-stage development. The second instrument is entitled *Alter Description Questionnaire* (ADQ) which is designed to gather information on the perceptions of a subject's desire to work with certain types of people.

The two instruments (SDQ and ADQ) are parallel in construction, one providing data on "What I Am Like," (SDQ) and "Who I would like to work with" (ADQ).

A postulate of compatibility similar to Schutz's FIRO (1960) has been worked out and is reported in Appendix C. The compatibility measure allows the experimenter to rank the subjects from high compatibility to low compatibility.

Battery 2, Delivery Channel: Battery 2 contains two instruments, both providing data on the delivery dimension of the subjects. The first instrument is entitled *Expressed Relations Questionnaire* (ERQ) which is designed to gather information on the self-perception of a subject in terms of work-emotionality categories.

The second instrument is entitled *Interpersonal Relations Questionnaire* (IRQ). It is designed to gather information on the perceptions of a subject's desire to work with certain types of people. Like the items in ERQ, the items in IRQ are constructed within the framework of the work-emotionality categories.

The two instruments (ERQ and IRQ) are parallel in construction, one providing data on "What I try to be in a group" (ERQ) and "What I like people to be like in a group" (IRQ).

A postulate of compatibility has been previously noted for SDQ and ADQ. The same procedures are used for ERQ and IRQ. The procedure is reported in Appendix C. The compatibility measure allows the experimenter to rank the subjects from high to low compatibility.

Formation of Dyads: Having administered the two batteries of tests, it was possible to make specific groupings of subjects according to the dyad formulation described in the Hypotheses Section. There was a sample of five groups consisting of each of the eight types of dyads. Each group of dyads were treated independently, and each dyad went through the experiment individually. Any one two-man dyad within any one group of dyads was in no way similar to any one of the remaining seven two-man dyads in that group.

There were 248 undergraduates who were asked to fill out the two batteries of tests. They filled these out independently and were asked to return them no later than one week after they received them. Places for returning them were arranged for convenience to subjects. A research assistant collected them from the arranged designations. Of the 248 who took the tests, 81% returned them, finished completely.

The final task in Phase I was to arrange forty (40) two man dyads. This required selecting eighty (80) subjects. To accomplish this, the formulas for compatibility (see Appendix C) were applied to the responses of each of the 200 subjects on the two batteries of tests. Each subject's scores were compared to each of the other subjects' scores, one battery at a time.

The total compatibility measure consists of three components. These are: (1) Reciprocal, which is to what extent do the two people represent what the other prefers, (2) Conflictual, which is the difference between what one is like as an individual group member and what one prefers to have in an individual group member, and (3) Similarity, which is the extent to which individuals are alike in terms of what they say they are and what they say they prefer. The scores for each of these three components were calculated first. Then, they were summed together (i.e. reciprocal + similarity + conflictual) to derive a total compatibility score. A computer program was developed to calculate these compatibility measures.

To establish the parameters of compatibility the following procedures were followed. First the two sets of questionnaires entitled Self Description and Alter Description Questionnaires, and the Interpersonal and Expressed Relations Questionnaires were scored. The scores for each of the subjects on one set of questionnaires were compared to each of the other subjects' scores on the same set of questionnaires. The formulas for their comparison are reported in Appendix C of this report.

The set of questionnaires for the motivation dimension consisted of 64 items in each questionnaire. It was shown from the formula that a difference of 0 would yield a compatibility score of 0. Furthermore, each 1 point difference contributed .19 to the total compatibility score. This is found by summing the three scores reciprocal, conflictual and similarity. These scores are initially fractions, with a denominator of 16. Sixteen is the number of categories being considered, eight positive ego stages and eight negative ego-stages. A difference of 1 on any one question on the questionnaires will result in a fraction of 1/16 in all three components of the total compatibility score. When summed together and changed to whole numbers the result is 3/16 or .19

From this it was decided, in order to be considered a compatible score, the subjects should agree on an average within 1 point on each of the items. From this, it was concluded that a compatibility score should be less than 12.16 for the motivation channel. It was also concluded that in order for a score to be considered incompatible, the subjects should differ on an average of 2 or more points on each item. This would result in a score of 24.32 or greater for incompatibility.

The set of questionnaires for the delivery dimension consisted of 72 items in each questionnaire. Similarly, with this set of questionnaires it was found that a difference of 1 would contribute .125 to the total compatibility score. This is found by summing the three scores, reciprocal, conflictual, and similarity. These scores are initially fractions, with a denominator of 24, indicating 24 categories being considered. A difference of 1 on any one question on the questionnaires will result in a fraction of 1/24 in all three components of the total compatibility score. When summed together and changed to whole numbers the result is 3/24 or .125. It was decided that the subjects should agree on an average within 1 point on each of the items. From this it was concluded that a compatibility score should be less than 9.00 on the delivery channel. It was also concluded that in order that a score could be considered incompatible, subjects should disagree on an average of 2 or more points on each item. This would require a score of 18.00 or higher for incompatibility.

Table 3 gives the final dyadic arrangements and compatibility scores on each of the channels.

Experimental Session

The procedural steps in the execution of the experiment are described chronologically.

> After the experimenter had identified the experimental dyads and groups of dyads, he scheduled each dyad for an hour and fifteen minutes. The composition of the dyads is presented in Figure 3.
>
> It was necessary to eliminate any status which may have resulted from a member arriving at the

TABLE 3
COMPATIBILITY SCORES ON EACH TYPE OF DYAD

DYAD TYPE	CHANNELS AND IDENTIFICATION					
		1	2	3	4	5
1 M ≡ D ≡ I ≡	M	10.62	13.94	10.19	12.25	14.06
	D	8.62	13.47	10.33	9.62	12.54
	I	C	C	C	C	C
	Group/Sex	14-F	6-F	10-F	4-F	39-F
	Members	11-89	15-3	13-26	51-81	97-86
2 M ≡ D ≡ I ≢	M	14.37	11.94	12.87	13.75	12.75
	D	8.29	10.17	12.71	10.33	12.79
	I	A + B	A + B	A + B	A + B	A + B
	Group/Sex	27-F	34-F	20-F	17-F	9-F
	Members	14-84	32-88	33-17	16-44	19-31
3 M ≡ D ≢ I ≡	M	16.44	14.94	16.37	15.50	15.87
	D	27.96	18.33	18.87	18.87	18.21
	I	C	C	C	C	C
	Group/Sex	15-M	12-M	33-F	29-M	28-F
	Members	62-170	207-105	125-9	203-227	39-95
4 M ≢ D ≡ I ≡	M	25.25	22.44	21.37	22.56	25.94
	D	12.12	14.12	14.42	13.33	13.42
	I	C	C	C	C	C
	Group/Sex	31-F	37-F	35-F	11-M	3-F
	Members	1-132	24-41	42-77	68-163	48-166
5 M ≡ D ≢ I ≢	M	14.19	14.50	16.80	16.81	16.00
	D	18.71	17.79	20.42	18.62	19.96
	I	A + B	A + B	A + B	A + B	A + B
	Group/Sex	23-M	16-M	32-F	30-M	38-F
	Members		136-196	74-69	179-223	83-7

TABLE 3 (Continued)
COMPATIBILITY SCORES ON EACH TYPE OF DYAD

DYAD TYPE	CHANNELS AND IDENTIFICATION					
		1	2	3	4	5
6 M ≢	M	23.37	22.81	21.44	22.50	24.25
D ≡	D	13.12	10.92	12.12	11.92	13.54
I ≢	I	A + B	A + B	A + B	A + B	A + B
	Group/Sex	7-F	18-F	21-F	21-F	24-M
	Members	25-118	35-113	47-160	59-120	57-116
7 M ≢	M	27.75	24.69	28.31	27.56	27.00
D ≢	D	28.96	19.42	26.79	26.04	23.54
I ≡	I	C	C	C	C	C
	Group/Sex	5-F	40-F	2-F	26-F	13-F
	Members	10-65	78-94	64-200	23-140	91-82
8 M ≢	M	24.69	28.69	29.50	28.69	27.56
D ≢	D	18.92	28.67	30.21	30.37	24.37
I ≢	I	A + B	A + B	A + B	A + B	A + B
	Group/Sex	36-F	19-F	25-F	22-M	8-F
	Members	90-12	92-2	53-176	122-124	40-218

	REPLICATIONS				
TYPE	1	2	3	4	5
1	M ≡ M D ≡ D I ≡ I	M ≡ M D ≡ D I ≡ I	M ≡ M D ≡ D I ≡ I	M ≡ M D ≡ D I ≡ I	M ≡ M D ≡ D I ≡ I
2	M ≡ M D ≡ D I ≢ I	M ≡ M D ≡ D I ≢ I	M ≡ M D ≡ D I ≢ I	M ≡ M D ≡ D I ≢ I	M ≡ M D ≡ D I ≢ I
3	M ≡ M D ≢ D I ≡ I	M ≡ M D ≢ D I ≡ I	M ≡ M D ≢ D I ≡ I	M ≡ M D ≢ D I ≡ I	M ≡ M D ≢ D I ≡ I
4	M ≢ M D ≡ D I ≡ I	M ≢ M D ≡ D I ≡ I	M ≢ M D ≡ D I ≡ I	M ≢ M D ≡ D I ≡ I	M ≢ M D ≡ D I ≡ I
5	M ≡ M D ≢ D I ≢ I	M ≡ M D ≢ D I ≢ I	M ≡ M D ≢ D I ≢ I	M ≡ M D ≢ D I ≢ I	M ≡ M D ≢ D I ≢ I
6	M ≢ M D ≡ D I ≢ I	M ≢ M D ≡ D I ≢ I	M ≢ M D ≡ D I ≢ I	M ≢ M D ≡ D I ≢ I	M ≢ M D ≡ D I ≢ I
7	M ≢ M D ≢ D I ≡ I	M ≢ M D ≢ D I ≡ I	M ≢ M D ≢ D I ≡ I	M ≢ M D ≢ D I ≡ I	M ≢ M D ≢ D I ≡ I
8	M ≢ M D ≢ D I ≢ I	M ≢ M D ≢ D I ≢ I	M ≢ M D ≢ D I ≢ I	M ≢ M D ≢ D I ≢ I	M ≢ M D ≢ D I ≢ I

Figure 3
DESIGN OF THE 8 TYPES OF DYADS WITH
5 REPLICATIONS OF EACH DYAD

location of the experiment prior to the other member. As members arrived for the experiment they were escorted to separate rooms. In this manner neither member had any knowledge of the other member until they were brought together at the same time in the group-discussion room (see diagram of Experimental Laboratory room layout in Appendix D).

When the subjects arrived and subsequently assembled in the group-discussion room, they were given the following explanation.

"Before you is a name card and a felt pen. Please print your name on both sides of the card. This will help in your discussion to identify each other by name."

"There are three parts to this portion of the experiment. The first part is to complete the questionnaire before you, and listen to a recording of a case study. The second part is a small group discussion. The third part is arranged to have you complete a final set of questionnaires. The specific tasks will be explained more fully at the outset of each part."

Each subject was given a booklet describing the processes of completing a semantic differential questionnaire. They were then given a semantic differential questionnaire containing thirty-two (32) items. The concept they were to relate the items to was 'the person with whom I would most like to work in a small work group'.

The experimenter then continued with this explanation:

"This experiment is designed to study the communication patterns among adults as they discuss the solution to specific problems. The problem you are being asked to discuss is presented in a case study. The case study takes about (eight) (sixteen)[1] minutes to read aloud. There are many groups involved in this experiment and so to avoid having a staff member read the case study to each group it has been recorded on tape. It is known that case study material can be more easily listened to individually than in a group setting. Individual listening booths have been set up in the adjoining room. Each of you will have an individual ear set. It does not matter which booth you select. After you sit down adjust the ear set for your own comfort. Since individual tape recorders are used, it is possible to adjust the volume level for each of you. If the volume is too great point down and we will adjust it to your liking. If the volume is too low point up and we will adjust it for you."

"After you have listened to the case study please return to this room. You will be asked to work on the solution of the problem which is presented in the case study."

"Would you please come into the next room and take yourplace at one of the listening booths."

There are two versions to the case study. One version is sympathetic to one of the two charaters in the case study. The other version is sympathetic to the other character. The subjects were unaware of this condition in the experiment. The experimenter, after the subjects selected a booth, plugged in patch cords to select similar or different versions. The table, presented below, has reference to the dyad composition described in the hypothesis section and shows the input for the information channel. Those groups which received identical information had the longer case study (sixteen minutes) which, in an integrated manner, contained both versions of the case study. Those groups which received different information got the shorter case study (eight minutes) but together the two members had the whole case study information, that is both versions of the case study.

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[1] The reason for the two indicated time period is explained later.

TABLE 4
INFORMATION INPUT FOR THE
EIGHT TYPES OF DYADS

DYAD TYPES		INFORMATION RECEIVED
1, 3, 4, 7	$1 \equiv 1$	Longer version
2, 5, 6, 8	$1 \not\equiv 1$	Member 1 receives version 1 while member 2 receives version 2.

The significance and justification of these input information procedures need to be clearly understood. There are two parts to the information channel behavior. First, there must be exchange of information. Secondly, there is a requirement for the dyad to reach a solution to the problem given in the case study. It is therefore essential for the dyad to have all the data. But regardless of the arrangement of giving both members all the information it is, in either case, necessary for them to work by exchanging information to arrive at a solution. Thus the task remains the same. What is different and what we were testing was that the exchange in relation to the other two channels (M and D) does not play as an important a role where lack of compatibility exists on M and D.

To put this in more concrete terms in the context of this experiment it is argued as follows. Where M and D are compatible but I is not for two members there will be less difficulty for them to work out a solution than a group composed of two members whose M and D channels are not compatible but whose I channel contains identical information.

While the subjects were listening to the case study, the experimenter returned to the group discussion room and placed before each subject's place a card containing the question to be discussed. When the case study was completed the subjects were asked to return to the group discussion room. They were given the following instructions and explanations by the experimenter.

"I mentioned before that we are studying the communication patterns of adults as they work on different kinds of problems. The window you see behind me, as you know, is a one-way glass. There will be no one observing you. I will be in and out of that room from time to time.

"It is obvious that the discussion is being video taped and audio recorded. (The video camera and two microphones were in the room.) The video tapes will be used by coders. They will identify, from the tapes, patterns of communication demonstrated as you work on the problem. The reason we need to video tape the discussion is because these patterns may not be recognized in total by one observation. Video tapes enable several viewings of the same discussion. The audio tapes serve two purposes. One is in the case something were to happen to the video tapes we would at least have the audio. The other purpose is to enable typists to type a transcription of these discussions. These transcriptions are necessary in that they may provide another type of communication analysis that cannot be observed as readily from the audio or video tapes directly.

"You are asked to play roles as two members of the administration committee of the church described in the case study. Your problem is to develop a solution to the problem described on the card before each of you. Although you are asked to assume a role of a member of the administrative committee, you are to be yourselves. That is don't play the role of another person, be yourself, act as you would if you were on a committee that had this problem."

Each subject was given the problem to solve. The problem was one of such a general nature that any prior information required to solve the problem was similar from subject to subject. That is, there is no specific, previous information or education required to work out a solution.

The specific assignment read: "You are members of the church board. The difficulty which has arisen between the two ministers has come to the board for solution. What position do you think the board should take and why."

After the subjects read the card the researcher gave the following instructions: "There are two more objects I would like to point out to you. The first is the red flashing light that you see before you now (The red flashing light was turned on prior to their entering the room.). This is a signalling device. When it *stops* flashing, you may begin your discussion. At that time the clock on the wall will begin to run. (The clock was divided down the middle creating two 1/2 hour sections. Only one half hour section was visible. The other section was covered with black construction paper making it virtually impossible to read the positions of the black hands on the clock. The reason for dividing the clock this way was to insure they knew at all times how much time had passed and how much was left. This is extremely important as time and ego-culture development are inter-dependent.) At the end of 1/2 hour, the clock will stop, and the red flashing light will begin to flash again, signalling the discussion session is over and that I will be entering the room.

"You have half an hour to reach a joint decision on the matter. Please do not discuss the problem or anything related to it until the flashing red light stops flashing. If there are no questions I will leave you now."

(The experimenter would leave the discussion room and turn on the video and audio recording units, unplug the red flashing light, plug in the clock and record which person initiated the discussion of the problem. These records were used by the information judges to identify on the transcripts the subject numbers of the two speakers.)

The audio tape recordings were used to enable typists to type out all utterances involved in the interactions of all dyads. These protocols were used as cross references for information coders. The video-tapes were used by three coders who viewed the tapes and coded the motivation and delivery aspects of the interactions within all dyads.

Post-Experiment Session

At the end of half an hour the experimenter entered the group discussion room and terminated the discussion in the following manner:

"The half hour is up and I am going to interrupt your discussion at this time. As I explained earlier, there is a third and last part to this study. It should take at the very outside no longer than half an hour. Mr. (Miss., Mrs.) (Subject) , if you would go with Mr. (research assistant), and Mr. (Miss, Mrs.) (Subject) , if you would go with Mr. (research assistant), it will be explained to you what needs to be completed."

"Since you may complete the last materials at different times may I thank you now for your cooperation. When you are finished and are ready to leave please see that Mr. (research assistant) or Mr. (research assistant) has all your materials. Thank you."

Each subject was taken to a separate room. Here the subjects were given three instruments in the following order:

1. Information Exchange Test
2. Semantic Differential
3. Post-Meeting-Reaction Q Sort

The Information Exchange Test was designed, as its name indicates to measure the member's perception of the exchange of information during the discussion period.

The concept for the Semantic Differential was the name of the other member of the dyad. The polar items are identical to the pre-experiment Semantic Differential Test.

The PMRQ sort was designed to cover all three channels. It follows a forced normal distribution of items.

A further description of these instruments is presented in Appendix B.

Instructions for completing each instrument were provided in writing. Each instrument was pointed out to each of the subjects. They were asked to notify one of the researchers before leaving. As they did this, the researcher would check the results of each of the three instruments for completion. If they were not completely finished the subject was asked to complete it. They were then asked to refrain from discussing the experiment with anyone until all the data had been collected which was projected to be about four weeks from that time. The subjects were told they would receive $2.50 in the mail shortly as a token of our gratitude for their assistance. They were also informed that we would arrange a meeting near the end of the spring semester to explain and discuss the intricate details of the research, and to relate any findings we may have at that time. Finally they were thanked again for participating.

After these instructions each subject's data were collected and filed in a folder which contained all the data for that particular dyad.

Pre-Experiment Program		Experiment Session	Post Experiment Session
Large sample takes the following instruments:	Formation of Dyads from tested sample (based on measures of compatibility of SDQ and ADQ; ERQ and IRQ.		
1. Self Description Questionnaire 2. Alter Description Questionnarie 3. Expressed Relations Questionnaire 4. Interpersonal Relations Questionnaire	All dyads take Semantic Differential Test---"The person I would most like to work with in a small group".	1. Dyads meet (one Dyad at each experimental session) and are given case study. 2. Problem Solving Instrument 3. Dyad discusses case study. (Observations and Video Taping)	1. Semantic Differential One on other member of Dyad. 2. PMRQ sort completed by each member. 3. Information Test completed by each member.

FIGURE 4
GENERAL DESIGN OF EXPERIMENT

SECTION FIVE
FINDINGS

General Statement on Reliability Among Judges

There were 40 dyads in the experiment. Therefore there were 40 one-half hour video tapes, or typed transcripts to code for each of three categories, ego - cultures, emotionality, or information. The training of the judges in each category is explained in Appendix A. It indicated the judges achieved a minimum satisfactory reliability score. In order to insure they were maintaining this level of reliability, there was a reliability checking system developed.

Time restraint prohibited each judge in each category from coding every dyad's discussion. Therefore, a different random sample of 10 dyads for each category were selected to be coded by each of the three judges in that category. It was decided that 20 dyads was a more realistic number of hours to expect from each of the judges. Therefore, each judge was assigned an additional 10 dyads which were randomly identified for each judge in each category. A table of randomized numbers was used for assigning dyads. Each judge coded a total of 20 dyads, 10 were in common with the other two judges and 10 were coded by that judge alone.

Table 1 in Appendix A describes which dyads were coded by all three judges and which dyads were coded by one judge. Each judge was given a list of dyad numbers assigned to him. None of the judges knew which of his dyads were in common with the other judges.

Two of the judges in the information category found they were unable to spend as much time coding as was necessary. Four of each of their assigned dayds were reassigned to the third judge.

When all three judges in any one category had completed coding those dyads which were in common, a reliability score was calculated among the three judges. The Pearson Product Moment r was calculated for the judges observing the Cultures, and the Guetzkow Correctness of Categorizing formula was applied to judges observing Emotionality and also the three judges coding

Information categories. (The rationale for using these statistics, and the formulas are presented in Appendix A, Training of Judges.)

The procedures for checking the reliability among the three judges in any one category was as follows. The codings of judge 1 were paired with those of judge 2, then with judge 3. The codings for judge 2 were paired with those of judge 3. This resulted in comparing each judge's codings with the other judge's codings within their respective categories.

Reliability of Coders on Group Culture

The results of reliability among the Culture observations are presented in Tables 5 and 6.

In checking for reliability among the judges on group culture it was found there were some unsatisfactory correlations. When this happened, a meeting of the 3 judges was arranged. They were asked to re-code the tape in question and a second reliability check was calculated while they were present. If the second reliability scores were still questionable, the two researchers and the judges discussed the areas contributing most to the discrepancies. Before going on, a mutual agreement among all 5 persons was reached regarding a more satisfactory coding. There were no instances where more than 1 point difference in weighting could not be agreed on mutually by all 5 persons. It should be noted that in some instances the second codings were not as satisfactory as the original codings. This prompted some long and in-depth discussions relating the theory and justification in coding. Further, after these discussions the reliability began to rise noticeably, indicating perhaps a richer understanding on the part of the judges. Following these discussions, each was asked to code individually their next dyad. After each had finished, a reliability score for each pair was calculated. This process was followed until there were satisfactory scores on 2 consecutive codings. All codings completed prior to these re-training sessions were re-coded by the respective judges.

TABLE 5
PEARSON PRODUCT MOMENT r BETWEEN EACH OF THE THREE JUDGES AND THE STANDARDIZED CODING OF THE TRAINING TAPES FOR THE GROUP CULTURES

DYAD NUMBER	CODERS COMPARED TO STANDARDS		
	1	2	3
Training 4	-.22	.48	.40
Training 5	.72	.91	.68

TABLE 6
THE PEARSON PRODUCT MOMENT CORRELATIONS AMONG THE THREE CODERS (JUDGES) ON THE GROUP CULTURES

DYAD NUMBER	CORRELATIONS BETWEEN CODERS		
	1-2	1-3	2-3
2	.93	.73	.77
3*	-.50	.80	-.40
	-.65	-.25	.62
4	.94	.70	.85
5*	-.10	.30	-.24
	.88	.78	.77
17*	.49	-.37	-.08
	-.52	-.52	.77
18*	.67	.61	.56
	.95	.93	.93
20*	.89	.78	.79
	.97	.88	.86
32	.96	.74	.73
38	.28	.38	.78
40	-.28	.11	.27

*When coder reliability was in question, each was requested to recode that tape.

Table 5 of the reliability scores among group culture judges demonstrates a high reliability between the judges and the standard set of codings. The judges appeared to be sufficiently trained to begin coding the experimental dyads.

Table 6 identifies there were a large number of reliability scores among the judges greater than the level (.70) previously set by the researchers as satisfactory. It should be noted that anything greater than .80 is considered to be exceptionally high for coding of this nature.

The reader will notice that toward the end of Table 6 there are some very low scores which were not re-coded. Several contributing factors account for these difficulties. The estimate of time required to train judges for this type of coding was based on experiences in training individuals who were very well informed in the underlying theory. The judges being trained at this time were much more naive, and found great difficulty in handling the subtle cues being demonstrated by the dyads. The judges had already gone beyond the time estimate originally set and the amount of time the judges were able to expend toward the coding. Furthermore, by exceeding our estimate of time required, we were exceeding the financial resources available to continue employing these judges.

Reliability of Coders on the Emotionality Channel

Procedures for checking reliability among the Emotionality judges were identical to those for the judges on group culture. The major exception is that Guetzkow's Correctness of Classification was applied for the analyses. The rationale for using this procedure and formulas for this statistic are explained in Appendix A.

Since each reliability check was above the standards set by the researchers, there was no need for any retraining or recoding.

TABLE 7
GUETZKOW'S CORRECTNESS OF CLASSIFICATION[1] AMONG EMOTIONALITY CODERS

DYAD No.	CODERS		
	1 - 2	1 - 3	2 - 3
Training 5	.84	.82	.80
4	.75	.70	.77
5	.81	.73	.83
9	.80	.71	.75
11	.71	.74	.88
12	.79	.80	.74
15	.72	.73	.85
28	.87	.89	.90
29	.88	.94	.92
30	.94	.92	.99
33	.76	.81	.84

[1] Guetzkow, Harold. "Utilizing and Categorizing Problems in Coding Qualitative Data." Journal of Clinical Psychology, VI (1950), 47-58.

Reliability of Coders on Information Channel

The same procedures were followed in checking the reliability among Information judges as were described for Emotionality judges. Table 8 reports the results of these reliability analyses.

TABLE 8
GUETZKOW CORRECTNESS OF CLASSIFICATION RESULTS
ON INFORMATION CODERS

DYAD NUMBER	CORRELATIONS BETWEEN CODERS		
	1 - 2	1 - 3	2 - 3
Training 5	.86	.80	.74
1	.82	.71	.71
8*	.56 .73	.20 .22	.33 .61
17*	.56 .70	.31 .50	.28 .57
18	.69		
23	.78		
24	.86		
25	.66		
29	.60	.60	.60
34	.68		
38	.67		

*When coder reliability was in question, each was requested to recode that tape.

It was found that dyad number 8 codings were not reliable according to the standards set by the researchers. The judges were asked to recode this dyad's essay. Following the completion of this task, a group meeting was arranged. A second reliability score was calculated. It was found that one of the scores was still unsatisfactory. Each of the codings for that dyad were then discussed. The discussion centered on explaining why each judge coded each item as he did. In this discussion insights were developed which aided the judges in coding according to the set criteria. The discussion was not finished until everyone agreed on the most appropriate coding based on the criteria for each item coded. The judges found one item which was so ambiguous that no coding could be assigned to it in terms of the set of criteria. This sole item was not included in the analysis of the data. It was decided that until two dyads in succession were coded with satisfactory reliability no further coding should be undertaken. They were asked to code the next common dyad again (#17). A group meeting was arranged and a reliability check was calculated. Again the results were under the standards set. They were asked to recode for the third time which they did independently. A group meeting was arranged. A second reliability check was calculated during this meeting. Since 2 scores fell below the standards, each item coded was explained by each judge as to why he coded in the way he did. A consensus was reached on all but 2 items as to the most appropriate coding. The ambiguity of these items were such that the criteria for coding items could not be used to classify these items. Accordingly these two items in this set of codings (dyad 17) were omitted from the data. They were then asked to recode the next common dyad. The next common dyad was #1. A reliability check was calculated and the results were satisfactory. The coders were then asked to code the next common dyad, #29. A reliability check was calculated. The score is not truly reflective of the relationships among the coders, which illustrates the problem of applying Guetzkow's technique. The codings for each pair of judges were identical. However, there was such a small number of items coded (4) that the results appear to be very low in respect to correlations. In the case of such a small n, the t-score which is used in the Guetzkow formula is very large. This increases the parameters for the upper and lower confidence interval applied in the formula for reliability.

When the second consecutive codings were found to be satisfactory, the judges were asked to recode all the dyads they had coded up to that time except for the ones which had been checked for reliability. Following these training sessions the reliability results were satisfactory.

During the retraining sessions, numerous hours were added to the judges' commitment to the experiment. Judge number 3 found it impossible to continue spending any more time on the project. He asked and was allowed to drop out. His four uncompleted dyads were assigned to judge 1 who agreed to spend that many more hours for the project. Judge 1 was asked because her coding results were consistently more accurate in terms of the criteria than those of judge 2.

Hypothesis One

The statement of the first hypothesis read:

> The dyad types will be ordered from 1 through 8 on the congruency of the pre and post semantic differential tests at a significant level $\overline{>}.05$.

The data are reported in Table 9.

It was assumed from the theory that those who were most compatible would demonstrate a high association between their ideal conception of a member and the person with whom they were paired. Further, that as the compatibility decreased so also would the association between a measure of an ideal group member and a measure of the perception of the paired member. The semantic differential tests which served as these measures did not demonstrate such an association. Thus in view of these results the methodology failed to show the expected association and accordingly the hypothesis was rejected.

The rejection of the hypothesis must be seen as providing evidence for the rejection of the theory. Although it would be a rash decision to herewith reject the theory outright it should be readily appreciated that these findings have dealt the theory a serious blow.

While it is not our intent to reason these findings away, it is our responsibility to point out certain considerations which have been made apparent to us as the research project progressed. One such consideration is the matter of length of time. Was one half hour ample time for two people to come to know each other sufficiently to make judgements about their liking or disliking of the other member. Our original thinking was that one half hour is sufficient. We have become more cautious in asserting this position and suggest that further research should be conducted to test our initial assumption.

Coupled with the issue of time is the issue of commitment. Does one reveal fundamental likes and dislikes for another individual when the association is an extremely limited relationship? It was our thinking that the individuals would be most free in describing their feelings about the other member because there were no obligations to deal with these feelings. However,it may have been this very lack of responsibility that resulted in the members reporting highly positive perceptions. There is some evidence to support this contention. Most students are willing to give a positive report of others with whom they have a limited association. Class members in small instructional groups have far stronger reactions to fellow class members and are willing to report these than are members of a larger and less interacting class group (Davie 1970).

The instrument may also have created difficulties. The projective technique of the semantic differential test may have observed specific factors on the like-dislike aspect being examined. In addition, following the lead of the idea presented in the previous paragraph the researcher administered the semantic differential pre test to a class of students. One half hour later he administered the post test and asked the members of the class to try to fill out this instrument identical to the way they had filled out the previous instrument which had been administered at the beginning of the class. The results clearly showed that individuals can remember how they have filled out a semantic differential a half hour earlier. (The results are given in Appendix B.) This raises the speculation that if as a member of a group I do not want to report negatively on another member there is a high likelihood that I could remember how I had filled out the ideal version and try to match my reporting version to that ideal version.

The considerations which have been raised in the preceeding paragraphs make it difficult to take a strong position in accepting the findings as being firmly conclusive. The findings on the testing of the first hypothesis must be admitted, however, as seriously questioning the validity of the theory.

The means reported in Table 11 although not clearly directional did appear to have some ordering from dyad type 1 through dyad type 8. Accordingly a Kendall Tau statistic was computed on the ranking. The results showed a Tau equal to .25. Although this result is not statistically significant it is sufficiently indicative to warrant caution in the rejection of the theory. The major point is that dyad types 1 and 2 were highest in the ranking as predicted. Dyad types 3 and 7 were seriously out of rank order as predicted. Much careful analysis of the factor which may be effecting these results must be undertaken before any action of accepting or rejecting the theory is taken.

TABLE 9

THE PEARSON PRODUCT MOMENT CORRELATIONS BETWEEN THE PRE AND POST RESULTS OF THE SEMANTIC DIFFERENTIAL QUESTIONNAIRE, WITH 5 REPLICATIONS OF 8 TYPES OF DYADS

DYAD TYPES	REPLICATION										MEANS
	1		2		3		4		5		
	SUBJECTS										
	1	2	1	2	1	2	1	2	1	2	
1	.804	.848	.953	.410	.772	.818	.908	.952	.848	.712	.803
2	.839	.712	.921	.958	.786	.886	.906	.713	.648	.691	.806
3	.832	.702	.594	.789	.821	.908	.725	.607*	.939	-.157*	.676
4	.389	.755	.592	.879	.839	.785	.948	.661	.842	.869	.756
5	.836	.878	.234	.906	.377	.703	.884	.881	.634	.556*	.689
6	.292	.812	.863	.905	.839	.926	.821	.641	.392	.271*	.676
7	.889	.551	.874	.703	.509	.836	.914	.863	.881	.971	.799
8	.780	.815	.909	.792	.839	.941	-.438	.926	.846	.889	.731

* Indicates correlations derived from the first sixteen items on the pre- and post-semantic differential questionaire. These subjects completed only the first half of one or the other administrations.

Hypothesis Two

It was conjectured that differing compatibilities would affect the manner in which group members would describe their group. That is, different channels would receive more weight in this description according to differing combinations of compatibility on the three channels.

The testable hypotheses are stated as follows:

2.a If $M \equiv M$, $D \equiv D$, and $I \equiv I$ then the group members will show a statistically significant preference ($\overline{>}.05$) for describing the group as a work group.

2.b If $M \equiv M$, $D \equiv D$ but $I \not\equiv I$ then the group members will not show a statistically significant preference for describing the group in terms of any one channel ($\overline{>}$ .05).

2.c If $M \equiv M$, $I \equiv I$ but $D \not\equiv D$ then the group members will show a statistically significant preference ($\overline{>}.05$) for describing the group in terms of the D channel.

2.d If $D \equiv D$, $I \equiv I$ but $M \not\equiv M$ then the group will show a statistically significant preference ($\overline{>}.05$) for describing the group in terms of the M channel.

2.e If any two channels are not congruent then the group members will show a statistically significant preference ($\overline{>}.05$) for describing the group in terms of the M channel.

To test these hypotheses, a Post Meeting Reaction Q sort was administered to each subject as the final test in the experiment. This instrument is described in Appendix B of this report. The purpose of this instrument is to identify which channel receives the most weight by the subjects as they distribute the cards. The subjects were instructed to distribute the cards according to the manner in which the statements described their group. The instrument is scored on a scale from 0 (least like) through 8 (most like).

After each of the Q sorts were scored, the results were combined by dyad type. That is, for each of the eight types of dyads there were ten Q sorts to combine. They were combined by finding the ranking of each of the 3 categories (channels) for all the subjects in each of the 8 types of dyads. A Kendall Coefficient of Concordance (W) was calculated for each dyad type. The formula used for this statistic was as follows:

$$W = \frac{S}{\frac{1}{12}(K)^2\ (N^3 - N)} \qquad \text{(Siegel page 231)}$$

S = sum of squares of the deviations from the mean for each of the categories M, D, and I.

K = number of individuals ranking the categories.

N = number of categories ranked.

$\frac{1}{12} K^2\ (N^3 - N)$ = the sum S which would occur with perfect agreement among K rankings.

This identifies the degree of agreement among the subjects within each of the dyad types in weighting the 3 channels.

The significance of these W's can be tested by determining the probability associated with the occurrence under a hypothesis of a value as large as the S with which the W's associated. By this method, the distribution of S under H_o has been worked out and critical values have been tabled (Siegel, p. 286). From this table it can be found that a K = 10, and N = 3, the S associated with the W must be 60.0 or larger for significance at or beyond .p $\leq$.05.

Table 12 summarizes the results of this statistical analysis.

Hypothesis 2.a states that if members are compatible, the members will show a preference for describing their group in terms of the I channel. The S value was 96 well beyond the significance level of S = 60 ($p \leq .05$). The findings support the sub-hypothesis 2.a. The findings clearly show that dyad type 1 represents this configuration.

Hypothesis 2.b states that if the dyads are incompatible on the I channel they will not show preference for describing the group in terms of any one channel. Dyad type 2 is representative of this configuration. The results on Table 10 indicate there was a preference significant at the .05 level for describing the group in terms of the I channel. The raw data table (see Appendix E of this report) demonstrates clearly that the I channel was ranked first, the M channel second, and the D channel third. Only two subjects deviated from this rank order. We cannot at this time explain this result within our theoretical framework. Therefore, we must reject this sub-hypothesis.

Hypothesis 2.c predicts that if only the D channel is incompatible, members will show a preference for describing the group in terms of the D channel. Dyad type 3 is representative of this configuration. The rank order data indicate there was a preference for describing the group in terms of the I channel, but the results were not significant. The raw data (see Appendix E of this report) indicate that the D channel differed very little from the I channel. Three subjects ranked the D channel first, whereas six subjects ranked the I channel first. Further, four subjects ranked the D channel second, and two subjects ranked the I channel second. Finally, three subjects ranked the D channel third while two subjects ranked the I channel third. These results are confusing. Therefore, it appears premature to reject this hypothesis at this time.

TABLE 10
SUMMARY OF KENDALL COEFFICIENT OF CONCORDANCE (W)
ANALYSES ON EACH DYAD TYPE BASED ON THE PMRQ SORT DATA

DYAD	CHANNELS			W	S
TYPE	Motivation	Delivery	Information		
1	2.5	2.5	1	.48	96*
2	2	3	1	.84	168*
3	3	2	1	.16	32
4	2	3	1	.76	152*
5	3	2	1	.76	152*
6	3	2	1	.64	128*
7	2	3	1	.76	152*
8	2	3	1	.79	158*

* Significance Level K = 10, N = 3
$S > 60.00$ at $<.05$ level.

Hypothesis 2.d states that if only the M channel is incompatible, members will prefer to describe the group in terms of the M channel. Dyad type 4 represents this configuration. The data indicates the members showed a statistically significant preference for describing their groups in terms of the I channel. The raw data substantiates this even further. That is, every subject weighted the I channel first, and six of the ten members weighted the M channel third. It would appear that this hypothesis must be rejected.

Hypothesis 2.e states that if any two (2) channels are incompatible there will be a significant preference for describing the group in terms of the M channel. Dyad types 5, 6, 7, and 8 each represent this configuration. Since each of these 4 types show a statistical preference for describing their groups in terms of the I channel, this hypothesis must be rejected based on the rank order analysis of the data.

From the rank order analysis of the data two questionable results can be identified. First, one of the five hypothesis was supported from the findings. While a second set of findings although not clearly supporting the third sub-hypothesis would suggest that it should not be rejected without further examination. The second result was that every dyad type showed preference for describing their group in terms of the I channel. These questionable results prompted the researchers to carry forward certain further analyses.

It was proposed that the number of cards in each category may have been an uncontrolled factor that may have effected the results. That is, there are 32 cards in the M category, 24 in the D category and 8 in the I category. A weighting system (see Appendix B) was developed to correct for this difference. However, this system may have been over-corrective. That is, it may have affected the smallest category more favorably than the larger categories.

It was decided to select only the extreme positions on the original distribution continuum. Hence, the six cards in the position of 'most descriptive' and the six cards in the position of 'least descriptive' were used in the analyses. The

4 cards in the most extreme positions were given the weight of 2. The eight cards in the second most extreme positions were given the weight 1. The rest of the sort was not considered in this analysis. The new scale was as follows:

	Unlike		Intervening Cards	Like	
Distribution	2	4		4	2
Weight	2	1	0	1	2

Furthermore, half the cards describe positive qualities and half describe negative qualities in each of the M, D, and I categories. Thus there are four categories. A subject may throw a positive quality card in the Like sector. He may also throw a positive quality card in the Unlike sector. In the first instance the description would be seen as a positive characteristic, in the second as a negative characteristic of the dyad. Likewise negative attributes may be viewed in a similar manner except, of course, in reverse manner.

If dyad members are compatible, one would expect the members to describe their group in positive terms. Therefore, when a subject distributes a positive statement as most descriptive and a negative statement (in the same category) as least descriptive they should be considered as meaning the same thing. Conversely, if group members are incompatible one would expect the members to describe their group in negative terms. That is, the like-positive and the unlike-negative statements would be less descriptive of his group than the like-negative and the unlike-positive.

The procedures for the next analysis were as follows:

Each subjects' PMRQ sort was scored using the redesign scale and the four sub-categories of the M, D, and I channels discussed above. The total possible score for any one individual was sixteen. Therefore, the total possible score for any one dyad was thirty-two. It was decided that there should be an indication of what proportion of the total score was contributed by each of the sub-categories in each of the M, D, and I categories. The formula used for figuring these proportions was:

$$\frac{1}{32} \times 100 = 3.125$$

Thus each score of 1 point contributed proportionately the value of 3.125. Figure 5 illustrates a set of dummy data, the categories and sub-categories used in this analysis. Each dyad's proportions were calculated for each sub-category. The proportions were summed by dyad. It was argued earlier that a like-positive in the most descriptive position is, in essence, the same thing as an unlike-negative statement placed in the least descriptive position. It was decided to sum the like-positive sub-category with the unlike-negative sub-category as well as summing the unlike-positive sub-category with the like-negative sub-category. After this was calculated for each dyad, the two resulting scores were summed across dyads within the same type. This resulted in 2 scores for each dyad type. To get a more realistic perception of dyadic proportions, these totals were each divided by 5 (i.e. the number of dyads within each type) resulting in an average score for dyads in each type. Table 11 is a summary table of these results.

TABLE 11
AVERAGE PROPORTIONED SCORES FOR DYAD TYPES IN EACH CHANNEL

TYPE	M CHANNEL CULTURES		D CHANNEL		I CHANNEL	
	L+/UL-	UL+/L-	L+/UL-	UL+/L-	L+/UL-	IL+/L-
1	50.00	1.875	25.625	4.375	17.25	1.875
2	55.00	4.375	21.25	3.75	9.375	6.25
3	34.375	15.00	30.00	12.50	4.25	1.875
4	45.00	8.75	20.625	10.00	10.625	5.00
5	43.125	11.25	24.375	8.125	10.625	1.875
6	45.000	8.75	28.125	6.25	7.5	3.125
7	50.00	3.75	23.75	6.25	14,375	3.125
8	40.625	6.725	28.750	4.375	15.00	4.375

DYAD No. ________

DONE BY ________

DATE ________

		PERSON 1	PERSON 2	TOTAL	DIFFERENCE	PROPORTION OF TOTAL (Pt)
EGO-STAGE	+ L	1	2,1	4	2	12.50
	+ UL	0	0	0	0	0
	- L	0	0	0	0	0
	- UL	2,2,1	2,2,1,1,1,1	13	3	40.625
EMOTIONALITY	+ L	2,2,1	1,1	7	3	21.875
	+ UL	1,1	0	2	2	6.25
	- L	0	0	0	0	0
	- UL	1	0	1	1	3.125
INFORMATION	+ L	1,1	2,1	5	1	15,625
	+ UL	0	0	0	0	0
	- L	0	0	0	0	0
	- UL	0	0	0	0	0

Figure 5
An Example of Re-scoring the PMRQ Sort

Table 11 provides evidence to seriously question the initial weighting system applied to the data. In addition several insights may be gained from a close examination of the results which add much to our testing of the theory.

The initial treatment of this set of data indicated that the I channel was consistently ranked higher than the M or D channels. By taking the end piles of the Q sort we get the values most highly descriptive of the groups. This description is consistently more of high D and M channels than the I channel. This is highly supportive of the theory.

It was predicted that dyads type one would describe themselves in terms of the I channel. This hypothesis was accepted in the initial analysis and is supported further in this analysis. Dyad type one described themselves more than any other group in positive I terms and least in negative I terms. The only other groups that equalled the low negative I were dyad types three and five, both of which are compatible on the M channel. These results further support the theory.

It was also predicted that dyad type 2 would not show a preference for any one channel. The set of data indicates this dyad type was very high on the M channel. This result is seen to question that aspect of our theory from which the sub-hypothesis was derived.

The results indicate that dyad type 2 was highest on the negative I attributes than any other dyad type. The M and D channels were compatible. Perhaps this allowed the group to perceive the I channel as being a problem, which of course it was. In the other groups where the I and the M and/or D channels were incompatible the I channel was not perceived as presenting the problem. Perhaps if M and D were compatible a group could identify the problem of I being incompatible. Dyad type 2 was comparatively low on the positive I attributes which further supports the above interpretation.

It was predicted that dyad type three would describe themselves in terms of the D channel. The initial results based on the total Q sort did not appear to support the hypothesis. The present set of data reveals that dyad type three is highest in both the positive and negative attributes of the D channel. This is as predicted. That is, they did describe their groups in terms of the D channel more than any other group. Further the M channel is lowest on the positive attributes for all dyad types and although high on the negative attributes, when positive and negative are combined this dyad type is lower than all of the dyad types on the M channel. Finally, the I channel is the lowest for this dyad type in both the positive and negative attributes. These results solidly support the hypothesis.

It was predicted that dyad type four would describe themselves more in terms of the M channel. This set of data reveals that although these groups are comparatively high in both positive and negative attributes of the M channel, they are the lowest in the positive D and highest in negative D, and is comparatively high in positive I, and very high in negative I. There is some ambiguity in these findings. That aspect of the theory related to this hypothesis should be examined. It may be that when just the M channel is incompatible, the members are unable to identify where the real problem exists. This may result in generalizing the problem to all three channels. This interpretation is supported by this set of data. Dyad type four is the only dyad that is consistently high to very high in the negative attributes of all three channels. Thus, further investigation is needed to understand the results.

It was predicted that dyad types incompatible on two or more channels would describe their groups in terms of the M channel. Dyad types five, six, seven, and eight were relatively high on the M channel across the M, D and I channels. However, the other dyad types which were compatible on more than one channel were also high on the M channel. These results are confusing and ambiguous. Dyad type 5, where D and I are incompatible is comparatively high in the positive attributes of I and very low in the negative attributes of I, whereas dyad type 6, where M and I are incompatible, is very low in positive I attributes and comparatively low in negative I attributes. Perhaps this could be interpreted that in terms of working, it would be better if the group members were compatible on the M channel than if they were compatible on the D channel. That is, if two channels are incompatible it is more serious in terms of hampering work if the two incompatible channels are M and I than if they were D and I. These findings present a need for further investigation.

The results of the above analysis strongly suggests that the theory has support and should not be rejected based on the existing data. The inital analysis was far less productive of interpretation than the subsequent treatment of the data. It appears reasonable to argue that the subsequent analysis most clearly indicated the strengths and weaknesses of the transactions of the particular experimental design and the theory here being tested. Clearly further study is called for in the testing of the theory.

Hypothesis Three

The third hypothesis was stated as five sub-hypotheses. These sub-hypotheses each examined an aspect of the information channel. The data for the testing of the sub-hypotheses were the post-meeting reports written by the subjects. The statement of the hypotheses read:

> The dyad types will be ordered from 1 through 8 on the analysis of the information test such that the dyad types will be differentiated significantly on:
>
> a. statements indicating joint development of decisions
> b. statements made by himself during the meetings
> c. statements made by other member during the meeting
> d. statement made by other member during the meeting but which he assumes authorship
> e. statement not made during the discussion period

It was argued that groups described on a continuum of progressively less compatibility would be marked by a greater emphasis on individual contributions and a misperception of authorship. Accordingly the post-session reports written by the members of the dyads were analyzed using a ranking of their reported perceptions on the group meeting. The specific procedures employed in this analysis is reported in Appendix B .

The raw scores and rank order for each of the five sub-hypotheses are presented in Table 12. The limited number of entries for sub-hypotheses d and e did not warrant their inclusion in the analysis. The Kendall Tau was applied to the data for sub-hypotheses a, b and c. The findings are reported in Table 13. The results for two of the hypotheses (a and c) were as predicted to a level that would indicate acceptable support for these hypotheses. The results for hypothesis b was in the predicted direction but at a level far below that which could be interpreted as support for the hypothesis.

TABLE 12

NUMBER OF RANK ORDER OF PERCEPTIONS OF WHO ORIGINATED IDEAS OBTAINED FROM THE INFORMATION TEST

DYAD TYPE	NUMBER						RANK ORDER		
	a	b	c	d	e	Total	a	b*	c*
1	7	20	15	3	3	48	4	4	3
2	14	22	16	7	7	62	1	5.5	4
3	8	22	8	2	3	53	3	5.5	5
4	3	25	11	2	3	44	8	7	2
5	9	11	9	1	2	32	2	1	1
6	6	18	22	1	2	49	5	2	7
7	5	27	22	2	0	56	8	8	7
8	4	19	22	1	4	50	7	3	7

*Inverted rankings. It was expected that from type 1-8 there would be progressively higher scores in these categories.

TABLE 13

KENDALL'S TAU (τ) ON EXPECTED RANKINGS AND OBTAINED RANKINGS ON PERCEPTION OF WHO ORIGINATED IDEAS

a	b	c
.43	.04	.44

The limited amount of material which the subjects wrote did not allow for the testing of sub-hypotheses d and e.

The pilot study in which graduate students who volunteered to serve as subjects wrote extensive post-meeting reports. It was the researchers' expectations that although it was not expected that undergraduates would write as much as the graduate students had done it was however expected that they would write at least one page of single spaced handwritten reporting. This was not the case. Since the researchers were able to perceive a high level of interest and commitment on the part of the graduate students it was suspected that there was far less interest and commitment on the part of those under-graduates based on a comparison of their post-meeting reports. The significance of this observation will be discussed more fully in the conclusion and recommendation sections.

Hypothesis Four

The statement of hypothesis four reads:

> There will be patterning of motivational behaviorssuch that there will be evidence of
>
> a. higher level of trust
> b. less conflict with autonomy
> c. more acceptance of initiative
> d. greater feeling of adequacy
> e. a greater clarity of ego identity
> f. more acceptance of intimacy
> g. more intense generativity
> h. a higher level of integrity
>
> on the part of dyad types 1, 2 and 3 over dyad type 5 and dyad type 5 over dyad types 4, 6, 7 and 8.

The data that were used to test these sub-hypotheses was gathered by the analysis of the video tapes. Three judges were employed who classified each dyad session with 8 positive and 8 negative motivation cultures based on Erikson's ego-stage theory. The procedures are explained in detail in Appendix A.

The results of the analysis are presented in Tables 14, 15 and 16. None of the results based on a one-way analysis of variance was significant. In comparison of dyad types 1, 2 and 3 with dyad type 5 only 2 of the 8 comparisons were in the predicted direction. Only one comparison was in the predicted direction in the analysis of dyad types 1, 2 and 3 over against 4, 6, 7 and 8. In the third analysis where dyad type 5 was compared with dyad types 4, 6, 7 and 8 there were 6 out of the 8 analysis in the predicted direction.

The lack of statistical significance and the uncertain patterns of the results in terms of predicted directions based upon what may be proposed from the theory leads neither to an acceptance or rejection of the hypotheses. In the strict sense of interpreting the results of our analysis the hypotheses are not supported by statistically significant findings. In addition, an examination of the predicted direction based on the means does not provide a broad support for the hypotheses. The lack of clarity in the results warrants at least a limited post hoc analysis.

If we were to focus on dyad types 1, 4 and 8 it would be possible to examine groups where the following compatibilities exist.

	Dyad Types		
Channels	1	4	8
M	$\equiv$	$\not\equiv$	$\not\equiv$
D	$\equiv$	$\equiv$	$\not\equiv$
I	$\equiv$	$\equiv$	$\not\equiv$

Thus dyad type 1 differs from dyad type 4 only in the M channel while dyad type 8 had no channel considered compatible. Further, if we were to consider the negative aspects of the cultures as coded from observations, it would be expected that dyad types 4 and 8 would demonstrate more negative qualities than would dyad type 1. This was found to be the case as reported in Table 17. These results clearly support the theory.

Although the results reported above are supportive of the theory they must be considered against the data on the positive aspects of the cultures which were not in general supportive of the theory. Taking both the positive and negative aspects of the cultures it would appear the dyad type 1 groups do not express the cultures in so an extreme a form as do dyad types where the M channels are not compatible. It may be conjectured that compatibility on the M channel creates conditions where the group members do not need to work on or express strong indications of these eight cultures. That is to say, since the members are compatible, for example on trust, the expression of trust or the working to establish trust is not necessary as there may exist an intuitive sense between the members of this sense of trust. If such were to be shown to be the case then the sub-hypotheses were naively conceived. This may well have been the case. The post hoc analysis appears to support the theory and in consequence makes questionably the conceptualization of the sub-hypotheses within the theoretical framework of the study.

The results clearly demand a more systematic examination of the expression and possible intuitive understanding of the cultures within small groups.

TABLE 14
MEANS AND F RATIOS OF THE POSITIVE CULTURES ON
DYAD TYPES 1, 2 AND 3 COMPARED WITH DYAD TYPE 5

Cultures	Means Dyad Types 1 2 3	 5	F. ratios	Direction Predicted
1	2.27	3.20	1.76	no
2	1.87	3.00	2.09	yes
3	1.87	3.00	2.08	no
4	1.67	3.20	3.45	no
5	1.80	2.80	2.68	no
6	1.53	2.00	.39	no
7	1.33	1.00	.32	yes
8	1.00	2.20	2.38	no

TABLE 15
MEANS AND F. RATIOS OF THE POSITIVE CULTURES ON DYAD TYPES
1, 2 AND 3 COMPARED WITH DYAD TYPES 4, 6, 7 AND 8

Cultures	Means Dyad Types 1, 2, 3	 4, 6, 7, 8	F ratios	Predicted Direction
1	2.27	2.90	1.27	no
2	1.87	2.45	1.03	yes
3	1.87	2.35	.75	no
4	1.67	2.10	.67	no
5	1.80	2.65	2.87	no
6	1.53	1.70	.08	no
7	1.33	1.55	.20	no
8	1.00	1.45	.70	no

TABLE 16
MEANS AND F RATIOS OF THE POSITIVE CULTURE ON DYAD TYPE 5 COMPARED WITH DYAD TYPES 4, 6, 7 AND 8

CULTURES	MEANS Dyad Types 5	4, 6, 7, 8	F RATIOS	PREDICTED DIRECTION
1	3.20	2.90	.21	yes
2	3.00	2.45	.53	no
3	3.00	2.35	.72	yes
4	3.20	2.10	1.72	yes
5	2.80	2.65	.04	yes
6	2.00	1.70	.19	yes
7	1.00	1.55	1.04	no
8	2.20	1.45	.74	yes

TABLE 17
MEANS ON NEGATIVE CULTURES FOR DYAD TYPES 1, 4 and 8

CULTURES	MEAN DYAD TYPES 1	4	8
1	3.4	3.6	4.2
2	4.2	4.4	4.4
3	3.6	4.2	3.8
4	3.6	4.4	4.4
5	3.6	4.0	3.6
6	3.2	5.0	4.8
7	3.8	5.0	4.6
8	2.4	2.6	3.4

Hypothesis Five

Hypothesis five dealt with the emotionality or the delivery channel of the dyads. It was stated in the following manner:

> Where the measure of compatibility is high between members, there will be high positive behavior in the emotionality categories. As compatibility progressively decreases, there will be a progressive trend towards high negative non-supportive behaviors.

Data to test this hypothesis were gathered from observations on the dyads using the video tape recordings.

To test the hypothesis the data were treated in the following manner. All supportive and non-supportive data were summed for each dyad type thus giving a total for supportive and non-supportive behaviors for each dyad type. A ratio of supportive to non-supportive was calculated using the following formula.

$$\frac{S}{S + NS} \times 100 = \quad \% \text{ supportive}$$

Where S stands for supportive and NS for non-supportive behaviors. The data were then examined using the Kendall Tau to determine rank order significance. The data are presented in Table 18 The Tau value was -.02. The results clearly do not support the hypothesis.

Certainly one of the most startling findings was that dyad type 8 was seen to have expressed no non-supportive behaviors. Since more than one judge made observations and there were acceptable reliability among the judges the finding becomes even more baffling. It may be proposed that such dyad types which are low on all measures of compatibility may stay away from conflict. This is contrary to the thinking growing from the theory which is here being tested. The results of the analysis of the data on emotionality of groups seriously questions certain aspects of the theory herein proposed. Further study of these questions should be made before the theory is rejected.

TABLE 18
MEANS, PERCENTAGE OF SUPPORTIVE OVER NON-SUPPORTIVE AND RANK ORDER OF EMOTIONALITY BEHAVIORS FOR THE 8 DYAD TYPES

DYAD TYPE	MEANS		PERCENTAGE	RANK
	S	NS		
1	66.0	9.2	88	2
2	59.4	18.8	76	8
3	43.2	12.6	77	7
4	68.2	10.2	87	3
5	71.2	13.6	84	4
6	59.8	14.8	80	6
7	54.4	10.0	84	5
8	78.0	0.0	100	1

Other Findings

1. One of the major points posited by the theory was that the I channel plays a less significant role in the transactions of a group than do the other two channels. This conjecture was examined from various contexts specifically, by testing hypotheses 1 through 5 reported on previously in this section. There was one result which provides substantial evidence in support of the theory. Twenty of the 40 dyads were given conflicting case study materials. The reader will recall that one member of dyad types 2, 5, 6 and 8 listened to case study A while the other member listened to case study B. Yet in not one of these 20 dyads did the members openly identify or even question whether both members heard the same case study.

In view of the fact that the members were together for a half hour discussion and that the two versions had striking conflictual material it is reasonable to hold to the argument, at least tentatively, the members of dyad types 2, 5, 6 and 8 must have been giving more of their attention to other communication problems than those in the I channel. Since dyad types 5, 6 and 8 were non-compatible on one or more of the other channels it could be argued that the noise from the other non-compatible channel prevents these dyads from recognizing the existence of the two versions of the case study. This interpretation does not hold for dyad type 2 because the other channels were classified as compatible. One explanation may be that channels M and D present such central and immediate problems even for compatible dyads that until the compatibility is perceived by the members they are not free to move to problems on the I channel. This reasoning is consistent with the theory but our results then force upon us a serious criticism of the design of the experiment. One-half hour discussion period is insufficient to provide time for members to work through perceptions of each other's life-style as given in the configurations of the M and D channels. This point is again spoken to in the Recommendation section of this report.

2. It was initially proposed that a minimum of 250 subjects were required as a base population. This was to increase the probability that each of the eight compatibility types could be arranged. Time requirements exerted a tremendous strain on the possibility of attaining the proposed base population.

First, the length of time required to complete the questionnaires, approximately an hour and a half, (the scores of which were to be used in forming dyads) had two affects. One affect was that the subjects were reluctant to spend that much of their time performing the task and therfore decided not to participate. The other affect was that some of the instructors were reluctant to release class time for this purpose requiring the students to complete the questionnaires in their free time.

Secondly, the research was originally intended to encompass ten months. When finally contracted there were only eight months to perform the experiment. This restricted the pursuit of recruiting more subjects.

A second problem was recruiting students. This is probably typical of most if not all research projects involving human subjects. That is, in order to insure one obtains unbiased data, human subjects must not be allowed the specific hypotheses being tested. Some prospective subjects declined to participate because of this.

It is true that 248 subjects elected to participate. However, only 200 completed the questionnaires. The original 250 subjects proposed is itself quite restrictive in selecting 40 pairs,(80 individuals) with specific types of compatibility. Reducing this figure to 200 is obviously that much more restrictive. This resulted in our being required to formulate some dyads whose compatibility scores were greater and/or incompatible scores were less than the pre-set scores. That is, a compatible score on the M channel was originally set at less than 12.16, while an incompatible score should have been greater than 24.32. Further, a compatible score on the D channel was supposed to be less than 9.00 and an incompatible score greater than 18.00.

The restrictions reported above, in addition to the following problems made it impossible to function strictly within these parameters. On several occasions, it was impossible to arrange a 1-1/2 hour time block when both individuals of a selected dyad could participate. On several more occasions one or both of the dyad members failed to appear at the arranged time. When this happened the person(s) failing to appear was (were) telephoned. The purpose of phoning was to arrange a different time. In most cases of this nature the phone calls revealed that the subject(s) had decided against participating. In either case, we were required to select dyads from the remaining population (200) from which subjects were being drawn without replacement.

This explains why some compatibility scores (see Table 3) are not within the pre-designated parameters. However, more important is the question "did this affect the results of the research project?"

A cursory examination of the raw data indicates that not being able to adhere strictly to the disignated parameters may have had some influence on the results. The possible effect on the results was tested by first identifying the one dyad most representative of a compatible dyad on M, D and I and then the one dyad purported to represent a compatible dyad but having scores outside the designated parameters. Secondly, the dyad which had scores most representive of an incompatible dyad on M, D and I and also a dyad which had scores least representative of an incompatible configuration and which was included in the incompatible set of dyads.

The raw data for these 4 dyads on their PMRQ sorts were compared. The results are given in Table 19.

These results indicate that dyad 14, the most representative of a compatible configuration, described their group precisely as predicted (see Hypothesis 2.a.). Further, it should be noted the members of this dyad describe their group in terms of high positive I behaviors. In contrast, dyad 39, that had scores outside the designated parameters on both M and D channels, clearly favored the M channel in describing their group. This supports the hypothesis (2.e.) namely, that when groups are incompatible on two or more channels they will describe their group in terms of the M channel.

TABLE 19
COMPARISONS OF BEST AND POOREST COMPATIBLE/INCOMPATIBLE DYADS ON THEIR PMRQ SORT RESULTS

CHANNEL	COMPATIBLE			
	BEST (Dyad 14)		POOREST (Dyad 39)	
	COMPATIBILITY SCORES	PMRA SORT PROPORTIONS	COMPATIBILITY SCORES	PMRQ SORT PROPORTIONS
M	10.62	34.38	14.06	68.75
D	8.62	34.38	12.54	15.63
I+		28.00		12.50
I-		3.13		3.13

CHANNEL	NON-COMPATIBLE			
	BEST (Dyad 25)		POOREST (Dyad 36)	
	COMPATIBILITY SCORES	PMRQ SORT PROPORTIONS	COMPATIBILITY SCORES	PMRQ SORT PROPORTIONS
M	29.50	56.25	24.69	53.13
D	30.21	12.50	18.92	31.25
I+		12.50		15.63
I-		18.75		0.00

The results on dyad 25, the most representative example of an incompatible configuration, supports hypothesis 2.e. Further, this dyad is incompatible on the I channel. As expected, the members described their group in high negative I terms. Whereas the results on dyad 36 selected as an incompatible dyad provides some perplexing results. That is, one might expect that the description of D channel for dyads 25 and 39 would be reversed. That is, a higher compatibility score on the D channel should result in a higher score on the PMRQ sort for this channel.

In addition, of particular interest is the contrast between dyads 25 and 36 in the I channel results. Dyad 25 is exceptionally high in the negative I descriptions and high in the positive I descriptions. Dyad 36 is quite high on the positive I descriptions and had zero negative I descriptions. Both dyads supposedly represent the same type, that is incompatible on all three channels. Their results should be more similar, especially in the negative I description. Perhaps the only explanation with the present data is the difference in their compatibility scores. That is, on both the M and D channels dyad 25 has high compatibility scores. On the other hand, the compatibility scores for dyad 36 are at the lowest extreme according to the designated parameters of incompatibility. Perhaps with compatibility scores this low, it is questionable whether the dyad should be classified as incompatible *or* compatible. It has been argued earlier that the designated parameters for compatibility appear to be accurate. Therefore, this dyad should not be classified as compatible. However, the results here indicate it is questionable to classify this dyad as incompatible. The end result is that perhaps the designated parameters of incompatibility need to be examined further in the possibility that they are set too low, particularly for experimental purposes of this nature.

It is recognized that one must be cautious in basing conclusions on such limited and isolated sets of data. However, the uncontrolled factors discussed above, coupled with the results of this limited sample clearly indicate that it is far too premature at this time to consider rejecting the theory. Further, some of the hypotheses need to be examined much more fully before accepting or rejecting can be adequately considered.

SECTION 6
CONCLUSIONS

If the attribute of power in theory building is applied to those theories which deny a wide range of events then it is readily recognized that the theory herein proposed is a powerful theory. Of course, this description does not ipso facto describe its worth. Its worth depends upon the testability of its conjectures and through empirical tests the withstanding of our attempts to falsify its conjectures.

To begin our discussion by describing the theory as *powerful* is intended in no sense to direct our attention away from the findings to the re-examination of the theory. That the theory is an attempt at the integration of much solid work by outstanding scholars has already been chronicled. There must be a recognition that this initial sortie be seen in the perspective of a pilot investigation. To act otherwise would distort it out of its significance at this stage of exploration and to ignoresubstantial contributions made by other researchers.

In general summary the findings present an ambiguous picture. The detailed account of the findings have been presented in the previous section. There was a trend for dyad types to be ordered from more compatible to less compatible on a congruency measure between what type of co-worker they wanted and the actual member they worked with. It was by no means a consistent trend. Perhaps the most critical insight into the results was the proposal that the time of the transactions between the members was too brief to develop significant involvement in order to get a more powerful reading. The result (Tau = .25) was not in a direction which would lead us to reject the conjecture based on the theory but neither was the result impressively supportive.

The conjecture that differing degrees of compatibility would be associated with specific patterns of describing dyadic sessions had various measures of support and rejection. Dyads most compatible on M, D and I do describe themselves more positively on I than all other dyadic types. When channel I was not compatible where M and D were the dyads described themselves mainly on the M channel. This is contrary to that which we would expect and the result is seen as seriously questioning certain aspects of the theory. It should be pointed out that this dyad (M ≡; D ≡; I ≢) had the highest negative description in the I channel. Perhaps the compatibilities in M and D permitted this group to see its real problem, namely, its conflictual information in the I channel . Dyad type 3 (D ≢) described itself much more in the D channel than any other dyad type. Clearly this is supportive of the theory. Dyad types 5 (M ≢) predicted to describe themselves in the M channel distributed their descriptions over all three channels. These results do not support the theory. Finally it was predicted that dyad types incompatible on two or more channels would describe their groups predominately in terms of the M channel. Although the results showed the M channel to be highest for these dyads this proved also to be the case for all the dyads. Therefore, little weight can be given to these findings. The failure in demarcating among the groups must be viewed as providing an ambiguous result which is seen as neither supporting or rejecting the theory.

It was proposed that the dyad types would be ordered 1 through 8 on five post-reporting observations made by the members of the dyads. The members did not report to a sufficient degree to test two of the five types of post-reporting observations and thus two were dropped from the analyses. All three results were in the direction predicted with two of three results being acceptable high (Tau = .43 and.44). From our findings it appears that 1) groups higher on compatibility measures (M, D and I) indicate joint development of decisions more often than those groups lower on compatibility measures and 2) higher compatibility dyad members give more credit to the other member than do lower compatibility dyad members. These findings are accepted as evidence in substantiating the theory.

The fourth hypothesis predicted a patterning of motivation cultures wherein the dyad types 1, 2 and 3 would be more positive than dyad type 5. None of the statistics were significant at the $p>.05$ level and only two were in the direction predicted. Clearly the results reject this hypothesis. When dyad types 1, 2 and 3 were compared to dyad types 4, 6, 7 and 8 the results showed only one comparison in the direction predicted and again none of the results were statistically significant. In the last analysis the results were much more supportive of the general hypothesis. Dyad type 5 when compared to dyad types 4, 6, 7 and 8 was shown to have more positive culture on 6 of the 8 comparions. However, none of the results were significant.

A further analysis was computed on the data. Focusing on the negative cultures of dyads 1, 4 and 8 it would be possible to test compatible against incompatible dyads. It was expected dyads 4 and 8 would be higher on the negative cultures because they were both incompatible on the M channel. The results showed this to be the case. Although this subsequent treatment of the data showed support for the general theory it must be weighted against the findings on the positive cultures which was by no means supportive of the data. It is not possible at this time to state in an affirmative manner either a position of rejection or support for the theory based on these conflicting analyses. Since it is somewhat more advisable to remain cautious of accepting clearly unsupported theories it may be the better part of judgment to withhold at this time support of the theory as it directly relates to ego cultures as employed in the study.

The fifth hypothesis advanced the position that more compatible dyads as compared to less compatible dyads would show more supportive behaviors during group sessions. A strange set of results were obtained. Dyad type 8 as observed did not show any non-supportive behaviors. Dyad types 2 and 3 as determined from a ratio of supportive over non-supportive showed portionally more non-supportive than supportive behaviors when compared to all other dyad types. The results of these findings seriously question this aspect of the theory.

In the last part of the Findings section two further pieces of evidence were provided. The first pointed out that none of the incompatible I channel dyads identified within their transactions that two versions of the case study had been employed. It was pointed out that not to recognize this condition could only be explained by the dyads being more concerned with other aspects of the transactions. Since M and D channels were seen to exhaust the dimensions of group transactions, it follows that these channels must have consumed the attention of the dyads. Such an argument follows the positions posited by the theory. This particular finding appears to lend support to the theory but it must be viewed along with the results provided from the other aspects of the present study some of which were not supportive of the theory.

The second piece of evidence was the compatibility scores. In the re-examination of the parameters between compatibility and non-compatibility the question was raised whether the differences were sufficiently large to meet the demands of an experimental design. This is a serious consideration and one which cannot be lightly considered. Certain evidence would indicate initially that a greater spread may have made significant difference in the results in favor of the theory. The exploration of this question was discussed extensively in the previous section. Subsequent studies should try to establish larger differences than were obtained here.

One aspect of the design which should not be omitted is the matter of time. The researchers took the position that the dimension in interpersonal transactions as conceptualized in the theory would be manifest within a half hour discussion. Certain findings would indicate that this condition was realized. Other findings seriously question whether such conditions did exist. If we were to accept that there was sufficient evidence to show the presence of the three channels, it would be argued that insufficient time was provided to develop the necessary commitment and personal involvement on the part of the members of the dyads. That is to say, they did everything they were asked to do but held back from risk-taking and significant involvement because '*this was only an experiment.*' As reported in the previous section this interpretation of the members behaviors was based on their limited self-reporting accounts of the discussions. It should not be implied that the subjects were uncooperative. That is not the point. The point is that it takes solid commitment and significant involvement before individuals will take risks in openly reporting their perceptions about their transactions. We may have failed to appreciate that even in a confined transaction such as was the case in the experiment individuals are most reluctant in reporting strong feelings. The other side of the coin is that although one may sense a fundamental difference between oneself and the other in the dyad care must be exercised to avoid a significant upsurge of conflict because the personal significance of the situation does not warrant it.

These speculations are in no sense offered as conclusions. They do point to the need for careful investigation. The questions they raise point to the re-examination of the methodology. The recommendation section which follows takes up these issues by focusing attention on the further testing of theory based on the knowledge gained from the present study.

SECTION 7
RECOMMENDATIONS

The recommendations which are briefly described below have been discussed from various contexts in preceding sections. The recommendations are set forth as guidelines for further research. The position that further research is warranted is assumed to have been justified from the findings of the present study.

1. It is recommended that subsequent studies be so designed that the groups have a life period of some six to ten meetings. There are several reasons for this guideline. Cultures or phase movements of groups could be more clearly demarcated as there would be sufficient time for the various cultures or phase movements to develop and reach prominence in the lives of the groups.

   A series of sessions would provide sufficient time for each member to establish his own life style in the group and to identify the characteristics of other members. If the theory does explain interpersonal transactions it would be difficult for the members to avoid acknowledging the existence of the channels.

   A series of meetings should move the members beyond a cooperation phase with the researchers to where commitment and involvement would be unavoidable issues in the group's transactions.

2. The present study used dyadic groups in the effort to achieve a relatively simple design. The researchers were aware of the position Bion (1950) had taken on dyadic groups. Since his reference was to therapy situations we questioned its direct implications to instructional and work groups. There is evidence for instance on the findings of the semantic differential data that pairing was significantly higher and more consistently characteristic of the dyads then one would have

expected of such groups. It is now recommended that no less than four members be considered a group for any further study of the theory. The group membership should not be greater than eight because of the difficulties that would be encountered in gathering the data.

3. The formulae to determine compatibility may have produced countering factors in identifying compatible members. The reciprocal formula is clearly defensible as a compatibility measure. Some questions may be raised about the conflictual measure and the similarity measure. In addition when these three were added to compose the compatibility measure equal weight was assigned to each of the three measures. It is recommended that a multiple correlation analysis be run on the data from these three measures to determine whether there are specific associations among these measures and the dependent variables. In addition a re-examination of the weighting of these three formulae should be undertaken.

4. Much insightful data may be obtained were the members of a compatible group reorganized for a second series of meetings with incompatible members. The intra and inter analyses are obvious and the results should be a severe test of the theory.

5. It is recommended that a much larger population pool form the base from which to select the subjects. The 200 proposed in the present study appears to be far too small a population from which to select compatible and incompatible members. The population should be somewhere in the neighborhood of 500 subjects.

6. If the theory is correct then it is possible that administrators of the project may act as a possible contaminator of the data. It is recommended that no less than 2 administrators be employed so that their possible effects may be factored out to determine their significance.

7. Training coders always presents some kinds of difficulties. Since coders are almost always graduate students they are frequently unable to fulfil their obligations because of other demands. For this and other reasons a pool of coders ought to be trained from which the research administrator may select as the situation demands. A pool is considered here to be five or six coders.

8. It is also strongly recommended that the administration of all pre-experimental instruments be supervised by the research team. This was not possible in the present project. To accomplish this all subjects should be paid a moderate fee, for example, two dollars to four dollars depending on the time necessary for the administration of the instruments.

BIBLIOGRAPHY

Bales, R. F., et al. Phases in group problem solving. Journal Abnormal Social Psychology, 1951, 46, 485-495.

Ben-Zeev, S. Comparison of diagnosed behavioral tendencies with actual behavior. Unpublished Ph.D. dissertation, University of Chicago, 1955.

Borgotta, E. F., and Eschenbach, A. E. Factor analysis of Rorschach variables and behavior observation. Psychological Reports, 1955, 3, 129-136.

Boyd, R. D., et al. A set of manuals for the three channel theory. Mimeograph, University of Wisconsin, 1968.

Boyd, R. D. and Koskela, R. N. A test of Erikson's theory of ego-stage development by means of a self-report instrument. Journal of Experimental Education, 1970, 38(4), 1-14.

Breer, P. E. Predicting interpersonal behavior from personality and role. Unpublished doctoral dissertation, Harvard University, 1960.

Collins, B. E. and Guetzkow, H. A social psychology of group processes for decision making. New York: John Wiley and Sons, 1964.

Davie, L. E. Eriksonian ego crises theory applied to small group phase progression. Unpublished Ph.D. dissertation, University of Wisconsin, Madison, 1971.

Erikson, E. H. Childhood and society. New York: W. W. Norton,(second edition) 1963.

Erikson, E. H. Identity and the lifecycle. Psychological Issues, Vol. 1, 1, New York: International University Press, 1959.

Erikson, E. H. Observation on the Yurok. University of California Publications in American Archaeology and Ethnology, 35, 10, 1943.

Fox, W. F. Group reaction to two types of conference leadership. Human Relations, 1957, 10, 279-289.

Fouriezos, N. T., et al. Measurement of self-orientation needs in discussion groups. Journal Abnormal Social Psychology, 1950, 45, 682-690.

Freud, S. Group psychology and the analysis of the ego. London. Standard Edition, 18. 1921.

Guetzkow, H. (Ed.) Groups, leadership and men: research in human relations. Pittsburg: Carnegie Press (1951) reissue 1960.

Hare, A. P. Handbook of small group research. Glencoe, Ill: Free Press of Glencoe, 1962.

Hare, A. P. Small group discussions with participatory and supervisory leadership. Journal Abnormal Social Psychology, 1953, 48, 273-275.

Hartmann, H. Ego psychology and the problems of adoption. New York: International University Press (1939) reissued, second edition 1958.

Hartmann, H. Essays on ego psychology: selected problems in psychoanalytic theory. New York: International University Press, Inc. 1964.

Havighurst, R. J. Human development and education. New York, Longmans, Green and Co., 1953.

Haythorne, W., et al. The behavior of authoritarian and equalitarian personalities in groups. Human Relations, 1956a, 9, 57-74.

Haythorne, W., et al. The effects of varying combinations of authoritarian and equalitarian leaders and followers. Journal Abnormal Social Psychology, 1956b, 53, 210-219.

Kluckholm, C. and Murray, H. A. (Eds.) Personality. New York: Alfred A. Knopf, 1948.

Leavitt, H. J. Some effects of certain communication patterns on group performance. Journal Abnormal Social Psychology, 1951, 46, 38-50.

Lippit, R. and White, R. K. Autocracy and democracy: an experimental inquiry. New York: Harper and Brothers, 1960.

Mead, G. H. Mind, self and society from the standpoint of a social behaviorist. Chicago, University of Chicago Press (1928) reissued 1950.

Schein, E. H. and Bennis, W. G. Personal and organizational change through group methods. New York: John Wiley and Sons Inc., 1965.

Schutz, W. C. FIRO: a three dimensional theory of interpersonal behavior. New York: Holt, 1958.

Schutz, W. C. What makes groups productive. Human Relations, 1955, 8, 429-465.

Stock, D. and Thelen, H. A. Emotional dynamics and group culture. New York: New York University Press, 1958.

Stogdill, R. M. Individual behavior and group achievement: a theory: the experimental evidence. New York: Oxford University Press, 1959.

Ziller, R. C. Four techniques of group decision making under uncertainty Journal Applied Psychology, 1957, 41, 384-388.

Supplementary References

Hays, William L., Statistics. Chicago: Holt, Rinehart and Winston, Inc., 1963.

Hays, Wm. L. and Winkler, R. L., Statistics: Probability, Inference and Decision. New York: Holt, Rinehart and Winston, Inc., 1971.

Kirk, Roger E., Experimental Design: Procedures for the Behavioral Sciences. San Francisco, California: Brooks/Cole Publishing Co., 1969.

Siegel, Sidney, Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill Book Company, Inc., 1956.

Snedecor, George W., Statistical Methods. Ames, Iowa: The Iowa State College Press, 5th Edition, 1956.

Wallis, W. A. and Roberts, H. W. Statistics: A New Approach. Chicago: The Free Press, 1959.

Walker, H. M. and Lev, J. Statistical Inference. New York: Henry Holt and Company, 1953.

APPENDIX A

PROCEDURES FOR TRAINING JUDGES

TRAINING JUDGES TO CODE EGO-CULTURES, EMOTIONALITY, AND INFORMATION

There were three sets of three judges selected to code three categories of variables; Ego-cultures, Emotionality, and Information. These judges were selected on the basis of their interest in coding and the time they could spend coding, outside of their class and class preparation time. They were all graduate students except one, who was a sophomore. None of them were experienced in any way in coding the categories they were assigned. One coder in the ego-culture category had done some work with the theory underpinning this category of coding.

The tasks of these three sets of judges was to code variables in their respective categories which were supplied by the discussions of the dyads in the experiment. Each of the three categories of variables was coded for every dyad. Therefore, a crucial element in training the judges involved coding from data presented in situations representative of the data they would code for the experiment.

There were three sources of data used in training judges. One was a 1/2 hour video tape recording of a dyad discussion of a problem, another was a typed transcript of these discussions, and a third was an essay describing the ideas expressed, who presented each idea, and how each idea was received in the discussion.

To obtain data similar to that which the judges would be coding, five training dyads were arranged. These five dyads were, apart from the forty used in the experiment. The training dyads consisted of two graduate students in each dyad. Sex was ignored, unlike in the experimental dyads.

Each of the training dyads were arranged as a 1/2 hour session, followed by a 15 minute writing period. This simulated the procedures in the experiment. However, instead of listening to a tape-recorded case study, each subject was provided a short, typed case study. Their task for the session was described in writing at the end of the case study.

The discussion room was set up exactly as it would be for the experimental dyads. That is, two chairs facing each other at 45^0 angles, a small table, a tape recorder microphone, a video tape recorder microphone, a potted plant and an ash tray were placed on the table, and a video tape camera were in the discussion room. The only things missing were a clock, which proved to be a bothersome omission, and a signalling device indicating 'start' and 'finish' the discussion, which proved to be somewhat awkward.

As each dyad arrived for their discussion session they were given the following instructions:

> "The research we are involved with is an investigation of communication patterns of adults as they work on different kinds of problems. I would like to thank you for assisting us in preparation of preliminary materials crucial to this research project.
>
> You will notice there are two sheets of paper on the table. There is one for each of you. On these sheets is a very brief background of a current issue in education, and the task we would like you to engage in during this discussion session.
>
> You will have half an hour to discuss and reach a decision on the issue. At the end of the half hour, I shall come in and end your discussion.
>
> Read the paper carefully, and if there are any questions I will be happy to answer them. We will take about five minutes for this. (While they were reading equipment was turned on and set to go.)
>
> (Following any questions.) I will leave you now and when I return it will be a signal that the half hour is over."

(Problem)--BUSING

> "Since 1954 there has been a progressively aggressive effort to institute busing of school children. That is, busing black children into predominantly white schools, and white children into pre-dominately black schools. The result has been

> numerous laws requiring busing, and a decrease in the number of black students attending predominatly black schools in the south and an increase in the number of black students attending predominatly black schools in the north. The disruptions in Pontiac, Michigan have illustrated that the problems of busing are not only relegated to the southern states. There are certainly numerous pros and cons concerning the issue 'to bus or not to bus'. Much of the controversy centers around educational improvement versus political manipulations.
>
> Your task is to examine the pros and cons of busing white children to predominantly black schools, and black children to predominantly white schools, and to reach a decision on the matter."

At the end of the half hour, the discussions were ended. Each subject was taken to a separate room where they were given the following instructions.

> "The half hour is now completed. Would you come with me for your final part in the research project. (Each was taken to a separate room.) There is one final task we would like you to complete. The task is described on this card. Please read the card carefully. If there are no questions you may begin. When you have completed the task as best you can you may leave. Thank you again for helping us."
>
> (The following are the instructions that were on the card.) "On the paper provided, you are asked to write a complete account of your impressions on 1) what ideas were given, 2) who gave them, and 3) how they were received in the discussion you have just finished. As you progress in describing what had occurred, you may happen to remember something which had occurred earlier in the discussion. Please include 1) the idea, 2) who gave it, and 3) how it was received. Do not be concerned that your description may jump back and forth in time. Simply note that the particular event occurred when such and such was being discussed.
>
> When you have finished writing, you may leave. Please leave the materials on the desk. Thank you."

A training manual for each category of codings was prepared. A description of idiosyncratic tasks and specific training procedures is presented in the following three sections titled Ego-culture Training, Emotionality Training, and Information Training.

Ego-culture Training

The first task for ego-stage trainees was to read carefully Chapter Seven in *Childhood and Society* by Erik Erikson. They were asked to commit to memory the characteristics of each of the eight stages of development, both positive and negative.

They were asked to write an examination without reference to the ego-stage material. The statement of the examination was to "write a description of each of the eight ego-stages, including at least five key characteristics of each stage both positive and negative." Their results were compared to a list of key characteristics developed by the researchers. Those categories which had fewer than five correct characteristics identified were rewritten by the trainees. The task was finished only when each trainee had correctly identified at least five key characteristics of each ego-stage both positive and negative. This took three trials of approximately one hour each trial.

The second task for each judge (trainee) was to distribute a 160 card Q sort according to the ego-stages from I through VIII. The deck is constructed in two parts, one labelled green and the other red. Each part contains one card representing each of five fields for each ego-stage both positive and negative. Thus, for each of eight stages, five fields positive, five fields negative equals (5 x 2 x 8 = 80) eighty Q sort cards. The judges were asked to distribute only one deck at a time. If they were not 80% accurate they were asked to distribute the second deck.

As it turned out, no judge was 80% accurate on the first trial. Each item was compared to the key for categorizing the cards in their respective ego-stage. Each incorrectly categorized item (card) was discussed, relating why it is considered to be representative of one ego-stage. Since it was not necessary to be accurate on the fields the percentage of accuracy required for satisfactory completion was accordingly set at 70%. By the end of the third trial one judge had achieved only 68% accuracy and the other two judges were over 70% accurate. It was decided that this task's usefulness had been saturated and the next task was begun.

A coding manual had been written (Boyd,1971), and a coding form and five training tapes had been developed. The next task for ego-culture judges was to carefully read the coding manual. After doing so, questions and answers were discussed to develop understanding. When all questions had been discussed, the form for coding ego-cultures was distributed and explained.

The judges' task was to view two video tapes twice. The first viewing was to get a 'feel' for, or a 'sense' of the culture the dyad is exemplifying, in terms of the eight stages, positive and negative. During the second viewing, each stage, both positive and negative was to be weighted according to the extent to which each of the sixteen differing cultures was developed. The weighting according to the coding sheet is a continuum from 0 - 7. The 0 means there is no evidence of any one of the cultures. The 1 means there is a minimal evidence possible but is almost impossible to identify specifically. The 2 means there is some evidence and examples can be identified if necessary. The 3 means there is definitely evidence suggesting a culture is fairly well established. The 4 is the point of ambiguity between a strongly developed culture (5) and a fairly well established culture (3). The 6 means that a culture is very strongly developed and there is a large body of identifiable evidence available to support this. The 7 means a culture could be no more fully developed. That is, there is evidence supporting nearly every key characteristic of a particular ego culture, and this evidence is strongly influential in the direction setting of the discussion.

The next step for these judges was to practice coding the training tapes. Tapes 1 through 3 were used for practice, tape 4 for a preliminary reliability check, and tape 5 a final reliability check.

Each of the training tapes were coded by the two researchers. Instances of discrepancies between their codings were discussed. That is, each accounted for his coding by identifying evidence to support the result. A consensus was reached on which if either was the most appropriate coding. This process was followed until there were master keys for each training tape.

The judges met as a group with one researcher and viewed tape #1 twice, after which they coded each category of cultures. When all 3 had finished the researcher read off the master key codings while the judges scored their own codings. Each time there was a weighting spread of more than one point between a judge's coding and the master key, each judge, and the researcher would identify evidence to support or reject his coding. A consensus was reached in every event before continuing. Training tapes 2 and 3 were coded in the same fashion.

Training tape 4, the preliminary reliability check was coded as a group also, but the researcher scored the result. A Pearson Product Moment r was calculated between each judge's coding and the master key. It was decided that if a judge were .75 or above, he was trained well enough to begin coding the tapes for the experiment. Two judges did not meet this standard. These two and the researcher met as a group and discussed the codings in the same fashion as for tapes 1, 2, and 3. These two judges were asked to then code tape 5. These codings were subjected to the same type of reliability analysis and the same standard was enforced as for tape #4. One judge fell slightly below the standard. After discussing the codings, it was decided that understandings of discrepancies were developed enough to begin coding the experimental tapes.

The whole process of training, not counting re-training, took about 28 hours for each judge. This was 18 hours longer than expected.

TABLE A-1
ARRANGEMENT OF DYADS FOR CODING BY JUDGES IN THE THREE CHANNELS

DYAD NUMBER	CULTURE			EMOTIONALITY			INFORMATION		
	Judges			Judges			Judges		
	C^1	C^2	C^3	E^1	E^2	E^3	I^1	I^2	I^3
1			X	X			X	X	X
2	X	X	X		X		X		
3	X	X	X	X					X
4	X	X	X	X	X	X			X
5	X	X	X	X	X	X	X		
6			X		X				X
7	X					X	X		
8	X					X	X	X	X
9		X		X	X	X	X		
10		X		X			X		
11			X	X	X	X		X	
12		X		X	X	X		X	
13	X					X		X	
14	X				X		X		
15		X		X	X	X	X		
16			X		X		X		
17	X	X	X			X	X	X	X
18	X	X	X		X		X	X	X
19			X	X			X		
20	X	X	X			X		X	

TABLE A-1 (Continued)
ARRANGEMENT OF DYADS FOR CODING BY JUDGES IN THE THREE CHANNELS

DYAD NUMBER	CULTURE			EMOTIONALITY			INFORMATION		
	Judges			Judges			Judges		
	C¹	C²	C³	E¹	E²	E³	I¹	I²	I³
21		X			X		X		
22		X				X		X	
23			X		X		X	X	X
24			X	X			X	X	X
25	X					X	X	X	
26		X			X		X		
27		X		X			X		
28	X			X	X	X	X		
29			X	X	X	X	X	X	X
30			X	X	X	X			X
31	X					X	X		
32	X	X	X	X			X		
33	X			X	X	X		X	
34	X				X		X	X	X
35		X		X			X		
36	X				X				X
37		X		X			X		
38	X	X	X			X	X	X	X
39			X	X					X
40	X	X	X			X	X		

Emotionality Training

The task of these judges was to code each dyad's supportive, non-supportive and flight behaviors demonstrated during their discussions. The materials used for training these judges was a 24 card Q sort, a manual, and the five training tapes described earlier.

They were first given the manual to read carefully and commit to memory six emotional modalities. The theoretical background for this manual are drawn from the works of W. R. Bion, H. Thelen, and R. D. Boyd principally. The test of knowledge gained having read the manual, was demonstrated by distributing the 24 card Q sort.

This Q sort had been developed by a group of individuals who have worked extensively with emotionality modality theory. It has been demonstrated to be reliable and valid. The six emotional modalities are: Fight, Dependency, Pairing, Counter Dependency, Counter Pairing, and Dependency Pairing. Each emotionality has four aspects, namely, *supportive*, *ambivalent*, *destructive* and *disengaging*. Flight was considered a category by itself.

The task of these judges was to distribute the Q sort into 5 piles according to the 4 categories of supportive, non-supportive behavior, and a pile for flight. This was done in a group setting but each trainee worked independently.

They were not asked to distribute the cards according to each emotional modality. The reason was that their task was to code according to supportive/non-supportive and flight. The reason they were required to learn the emotional modalities was that sometimes supportivness can be misunderstood to be non-supportive or even flight. That is, it may appear that a person is non-supportive simply because he exhibits a flight emotionality. It was decided that if the judges could distribute the cards in the supportive/non-supportive, and flight categories with 80% accuracy, they had reached a sufficient level of competency. A simple percentage ratio was calculated for each person's distribution.

The first trial resulted with no one trainee meeting the standards of 80% accuracy. Each incorrectly categorized statement was discussed. It was indicated why an item was categorized according to the key devised when the Q sort was developed. Another meeting was arranged where the judges were asked to perform the same task over again. Each of the three judges satisfied the 80% accuracy criteria.

The next task was to practice coding the training tapes, using the coding form for supportive/non-supportive and flight behaviors. The original unit to be coded was each sentence in the discussion. The sentence was to be coded according to supportive 2 or 1 (supportive, ambivalent), non-supportive, 1 or 2 (disengaging, destructive), or flight. Judges met as a group and coded. After attempting to code the first training tape it was found that the unit of utterance was not long enough and it was nearly impossible (time-wise) to differentiate the two divisions of supportive or non-supportive behaviors.

A revised coding form was developed. The judges asked to weight supportive/non-supportive behaviors either 1 or 2 and flight weighted 1. The weights were to measure the degree of supportiveness or non'supportiveness whichever category was ended. The unit of coding was expanded to the complete utterance of an individual. That is, all the individual said prior to being either interrupted by the other person or finishing what he had begun.

The second training tape was coded using the new coding form and the new unit of coding. It was found that there was much unnecessary tallying required which hampered the coders, and that it was not easy to interpret supportive weight one (1) differently than a non-supportive one (1) or a flight utterance. The reason appeared to be that a supportive 1 was an ambivalent statement. This meant that there was a question of whether it was a supportive, non-supportive or even flight statement. The problem also came up that a 2 did not seem to reflect the true weight of some statements. That is, some appeared to be more supportive than a two would indicate or more non-supportive whichever the case may be.

A revised system was developed. For each category of supportive behavior there were three weights established according to the degree of supportiveness or non-supportiveness the utterance reflected. A 1 meant that the utterance was merely suspected as being in the category in which it was coded. That is, a supportive 1 meant that it could be a non-supportive statement, but is more supportive than non-supportive. A 2 meant that it was clearly representative of the category in which it was coded. A three meant that the utterance not only clearly represented that category, but that it was strongly supportive (or non-supportive). The flight category was not weighted since it is either flight or not flight and there is no certainty at this time whether flight ought to be categorized as non-supportive or supportive.

Using this system, the third training tape was coded. It was found there were numerous non-verbal cues of supportive/non-supportive and flight behaviors, and there were numerous interjected verbal utterances too short to call a total utterance (i.e., "uhuh, mm, 'yes', etc.)

Further modification was developed. This took into account all these non-verbal cues and short interjecting utterances both verbal and non-verbal. The system of weighting was not changed, but categories were developed for supportive and non-supportive interjected verbal and non-verbal utterances.

Training tape 4 was coded using this system. It was found that for the most part the system was sound. One problem was that sometimes a short, verbal utterance, when it followed a complete utterance could be coded as an utterance one time and not at another time. It was also found that the speaker sometimes demonstrates flight while the listener also may or may not demonstrate flight.

A new and final system was developed. An analogy of 'carrying a football' was used as a guideline. It was decided that, an interruption was to be coded as an interruption only if the person interrupting did not actually take over as principle speaker. That is, if he did not "take the football" it was an interruption. If he did take over as principle speaker, it was coded as a new utterance. In relation to shorter interruptive utterances the following rules applied. It was arbitrarily set that if an utterance is 5 words or less, it is to be coded an interruption. And, if the listener does not respond within 5 seconds, the person speaking is to be considered the principle speaker, therefore his utterance is merely elongated by the listener's neglect to respond. It was also decided to differentiate between speaker flight and listener flight.

The group of judges met to code training tape 5. To check on reliability among coders, the statistic applied was Guetzkow's correctness of categorizing. The reason for using this statistic was that there were such large numbers of codings. The use of the t test in the statistic is more precise than a straight Pearson Product Moment r. Furthermore, the number of categories in each section were not binomial. Finally, the Guetzkow is a more stringent statistic than correlation if the number of items coded happens to be small. It was decided that if the reliability among codings was greater than .70 the judges were sufficiently trained to begin coding the experimental tapes.

The judges coded training tape 5 independently. When each had completed their coding, the researcher calculated the reliability using the Guetzkow formula which follows:

$$P = \frac{(t^2 + 2NP^1) \pm \quad (t^2 + 2NP^1)^2 - 4\,(t^2 + N)\,N\,(P^1)^2}{2\,(t^2 + N)}$$

P = Confidence limits
(the lower one was used in the next formula.)

Thus, (finding P) where K = the number of categories and P^A = proportion of agreements and P = lower confidence limit.

$$P^A = \frac{(\frac{2}{K-1} \quad \pm \quad (\frac{2}{K-1})^2 \quad - [4\,(\frac{k}{k-1})\,(\frac{1}{k-1} - P)}{2\,(\frac{K}{K-1})} .$$

All three judges were above the .70 level for correct classification categories. The total hours were 29 spent in training. This was 19 hours more than expected.

Information Training

Each subject was requested to write a short essay in which he was to identify the ideas that were given in his group's discussion and who originated the ideas. The task of the judges in this analysis was to identify the ideas that were indicated in the essays and locate these ideas in a typewritten transcript of the discussion. The judges were to categorize these ideas according to one of sixteen different categories as illustrated on the Coding Form for Information which is included at the end of this section.

The materials used in training these judges were a manual and transcripts of the 5 training tapes.

The judges met as a group of 3 plus one researcher to discuss coding procedures. Since this was the first time coding of this nature was attempted in this laboratory the manual for coding information was very brief. It was merely a sketch of coding procedures and an example of codings. The discussion in the first meeting centered about reaching a consensus on the concept of what is an idea. It was agreed that an idea was the formulation of an opinion, a plan of action, an abstraction, or a generalization. (The 'or' means 'equal to' not 'instead of'.) After this discussion a time was arranged to meet and discuss the codings of the first training dyad's essays.

Each judge coded the essays independently. During the second meeting it was found that some were not clear yet as to the many different forms ideas can take, and the manner in which some writers relate the ideas. This was discussed and consensus was reached. Another meeting was arranged in which the judges coded training tape 2 in a group of three, each working independently. The results were then discussed immediately following their coding.

During this discussion it was noted that extreme caution must be executed in identification of which person in the dyad was speaker 1 and who was speaker 2. Other than that, it appeared more practice was necessary in improving accuracy. For the next meeting judges were instructed to code training dyad #3. Before leaving, the speaker numbers were identified.

During the discussion of the third coding it was found that the judges were improving and that the coding procedures were sound. The problem was that the judges had identified a different number of ideas given. This necessitated a discussion which was designed to using the conceptualization of 'what is an idea', explain each idea which was identified. This process helped the judges to reach a consensus on the number of ideas presented as well as re-defining for them what is meant by an idea.

They were then instructed to code training dyad number 4. A meeting was arranged to discuss the results.

During the discussion of this meeting it was found that some did not fully understand the meaning of joint development of an idea. This was discussed and a consensus reached that a joint development was an idea which incorporated both persons suggestions either in full or in part. The judges were then assigned training dyad number 5 to code. This was to be the final reliability check among these judges. It was decided that Guetzkow's Correctness of Categorizing test (explained and formulas given in the Training Emotionality Coding section) would fit this coding most appropriately. The reason for employing this procedure was that there were from 0 to infinity possible N's, within each category. There would likely be more than one coding, and in no event was it a binomial distribution. The satisfactory level was to be .70 or higher.

The codings were checked for reliability pairwise, until each one had been compared with each of the others. The codings were checked for being in agreement or disagreement first. Guetzkow's test was applied to this reliability check. Each of the judges' codings surpassed to .70 stipulation previously set by the researchers.

APPENDIX B

DATA GATHERING INSTRUMENTS

DATA GATHERING INSTRUMENTS

List of Tests Described in This Appendix

The following instruments and procedures were employed in this research project and are described in detail herewith.

1. Self Description Questionnaire (SDQ)
2. Alter Description Questionnaire (ADQ)
3. Expressed Relations Questionnaire (ERQ)
4. Interpersonal Relations Questionnaire (IRQ)
5. Semantic Differential Test
6. Post Meeting Reaction Q Sort
7. Information Test (Post-Meeting)
8. Observations of Ego-Stage Concerns
9. Observations of Emotionality

Self Description Questionnaire (SDQ)

The instrument is designed to gather data on a subject's perceptions of his behavior patterns. The subject is not made aware of the Eriksonian conceptual framework in which the items are structured. The subject is requested to indicate on a like-unlike scale his most usual behavior. Each item is constructed to be an example of the ego crisis of a particular ego-stage. Each item reflects a positive or a negative valence to the solution of the ego crisis. For example, an item classified in ego-stage II positive (autonomy versus shame and doubt) reads:

"I openly accept the mistakes in judgments I make."

There are 64 items. Thirty-two of the items refer to the positive phases of the eight ego-stage crises, the remaining thirty-two to the negative phases. Thus for each ego-stage there are four positive items and four negative items.

A six point scale is employed as is shown below.

LIKE-DISLIKE SCALE

Not at All Like Me	Very Little Like Me	Somewhat Like Me	Pretty Much Like Me	Much Like Me	Very Much Like Me
.	.	.	.	.	.

The subject is requested to mark one of the six categories. Mechanical answer sheets are employed which are scored by an electric scoring machine. The machine punches computer cards for each subject's set of scores. These cards can be directly fed into existing computer programs.

The table which follows presents an illustrative set of data for a subject.

TABLE B-1

RAW SCORES ON THE SELF DESCRIPTION QUESTIONNAIRE OF A SUBJECT

VALENCE	EGO STAGE							
	1	2	3	4	5	6	7	8
+	22	26	27	18	19	21	17	19
-	14	12	15	11	17	9	11	10
Total	36	38	42	29	36	30	28	29

The reliability of internal consistency for the SDQ has been determined by the Hoyt Reliability scale. There is a high correlation between items: r = +.94.

Alter Description Questionnaire

The instrument is designed to gather data on a subject's perceptions of his preferences for types of behavior he would like to receive from another member in a group setting. The subject is not made aware of the Eriksonian conceptual framework in which the items are structured. The subject is requested to indicate on a never-frequent scale his preference for a particular behavior to be received from another group member. Each item is constructed to be an example of the ego crisis of a particular ego-stage. Each item reflects a positive or a negative valence to the solution of the ego crisis. For example, an item classified in ego-stage V positive (ego identity versus role confusion) reads:

> "I like to work with a person who has developed his own individual style of life."

There are sixty-four items. Thirty-two of the items refer to the positive phases of the eight ego-stage crises, the remaining thirty-two to the negative phases. Thus for each ego-stage crisis there are four positive items and four negative items.

A six point scale is employed as shown below:

Never or Very Seldom	Seldom	Fairly Seldom	Fairly Frequent	Frequent	Very Frequent

The subject is requested to mark one of the six categories. Mechanical answer sheets are employed which are scored by an electric scoring machine. The machine punches computer cards for each subject's set of scores. These cards can be directly fed into existing computer programs.

The table which follows presents an illustrative set of data for a subject.

TABLE B-2
RAW SCORES ON THE ALTER DESCRIPTION QUESTIONNARIE OF A SUBJECT

VALENCE	EGO STAGE 1	2	3	4	5	6	7	8
+	16	15	20	18	19	28	17	15
-	7	10	10	12	19	16	11	12
Total	23	25	30	30	38	44	28	27

The reliability of internal consistency for the ADQ has been determined by the Hoyt Reliability scale. There is a high correlation between items: r = +.94.

Expressed Relations Questionnaire (ERQ)

The instrument is designed to gather data on a subject's work-emotionality preferences as the subject himself perceives these preferences. The subject is not informed about the conceptual framework in which the items are structured. He is requested to indicate the strength of his preference for a particular type of behavior. Each item exemplifies a specific type of work-emotionality. For example, an item classified as 4F (work level 4, and fight emotionality) reads:

> "I like to fight for many varied answers to a group's learning problems."

There are 72 items. Since each item has two dimensions (work and emotionality) and there are four work levels and six types of emotionalities, there are accordingly 24 specific categories. There are three items to each category thus making 72 items in all.

This study is not concerned with the work aspect of statements. We would like to record the work aspects in future research which could be done with this particular question in mind.

A seven point answer scale is used. The notation description of each point is shown below:

Not At All Like Me	Very Little Like Me	Some-what Like Me	More Like Me Than Not	Pretty Much Like Me	Much Like Me	Very Much Like Me
.	.	.	.	.	.	.

The subject is requested to mark one of the possible seven answers. Mechanical answer sheets are provided. The answer sheets are scored by an electric scorer which in turn punches computer cards. These cards can be directly fed into existing computer programs.

The table which follows presents an illustrative set of data for a subject.

TABLE B-3
RAW SCORES ON THE
EXPRESSED RELATIONS QUESTIONNAIRE OF A SUBJECT

WORK LEVELS	EMOTIONALITIES F(40)[1]	FL(80)	P(60)	CP(50)	D(20)	CD(30)	Total
1	18	17	11	14	10	17	87
2	10	19	12	14	11	6	72
3	19	18	19	18	19	18	111
4	17	15	16	9	13	10	80
Total	64	69	58	55	53	51	

The reliability of internal consistency for the ERQ has been determined by the Hoyt Reliability scale. There is a high correlation between items: $r = +.95$.

[1] These numbers refer to the coding matrix. See section2.29.

Interpersonal Relations Questionnaire (IRQ)

The instrument is designed to gather data on a subject's perceptions of his preferences for types of behavior he would like to receive from another member in a group setting. The subject is not informed of the fact that the items are structured within the work-emotionality conceptual framework. The subject is requested to indicate on a never-frequent scale his preference for a particular behavior to be received from another group member. Each item is an examplar of a particular type of work-emotionality. For example, an item classified as IP (work-level 1, and pairing emotionality) reads:

> "I like a group member who reminds the group of the need for unity and warmth."

Similar to the ERQ, there are 72 items. There are three replications for each of the 24 work-emotionality categories.

A seven point answer scale is used. The notation description of each point is shown below:

Stronly Dislike	Dislike	Moderately Dislike	Vacillate	Moderately Like	Like	Strongly Like
.	.	.	.	.	.	.

Similar to the other test instruments a mechanical answer sheet is employed. The answer sheets are scored by an electric scoring machine which produces punched computer cards. There is one or more cards (depending on the length of the test) for each subject. The ERQ and IRQ use only one card each. These cards can be directly fed into existing computer programs.

The table which follows presents an illustrative set of data for a subject.

TABLE B-4
RAW SCORES ON THE
INTERPERSONAL RELATIONS QUESTIONNAIRE OF A SUBJECT

WORK LEVELS	EMOTIONALITIES F(40)[1]	FL(80)	P(60)	CP(50)	D(20)	CD(30)	Total
1	15	15	14	15	15	17	91
2	15	14	14	16	12	11	82
3	15	16	18	15	13	14	91
4	17	16	15	12	13	15	88
Total	62	61	61	58	53	57	

The reliability of internal consistency for the IRQ has been determined by the Hoyt Reliability scale. There is a high correlation between items: $r = +.94$.

[1] These numbers refer to the coding matrix. See section 2.29.

Semantic Differential Test

The general structure and design of the semantic differential is assumed to be sufficiently known to the reader that a general description of the instrument is not needed.

The purpose of the SDT is to measure the differences between dyad members' perceptions of the type of person they would most like to work with in a group (pre-test) and perceptions of the person they worked with in the dyad (post-test). It is conjectured that the smallest differences will be found in dyads where members are congruent within their three channels of communication (i.e. $M \equiv M$, $D \equiv D$, $I \equiv I$). Differences will be greatest when dyad members are incongruent within their three channels of communication ($M \not\equiv M$, $D \not\equiv D$, $I \not\equiv I$). Differences will become progressively greater according to the hierarchy of importance of the three channels of communication.

There are two administrations of this instrument for the proposed study. The concept in the first administration is:

> The person I would most like to work with in a small work group.

The concept in the second administration is:

> The name of the other member in the dyad.

Both tests are identical except for the concept applied in the two separate administrations. There are 32 items on the test. The test employs the conventional 7 point scale.

Mechanical answer sheets are supplied to the subjects. After the answer sheets have been checked to see that every item has been marked, the answer sheets are fed into an electric scorer. The scoring machine punches computer cards which can be directly fed into existing computer programs. This procedure eliminates possible human errors in scoring and transposing scores.

The table which follows presents an illustrative set of data for a subject on the pre- and post-administration of the Semantic Differential tests.

TABLE B-5
RAW SCORES ON THE PRE AND POST SEMANTIC DIFFERENTIAL TESTS OF A SUBJECT AND DIFFERENCES

Item	RESULTS Pre	Post	Diff.	Item	RESULTS Pre	Post	Diff.
1	7	3	4	17	5	6	1
2	4	1	3	18	2	6	4
3	1	1	0	19	4	3	1
4	3	6	3	20	6	6	0
5	7	3	4	21	2	6	4
6	1	4	3	22	2	5	3
7	6	2	4	23	6	3	3
8	2	2	0	24	7	6	1
9	1	6	5	25	4	4	0
10	4	3	1	26	6	3	3
11	7	4	3	27	2	6	4
12	2	6	4	28	6	3	3
13	6	4	2	29	3	4	1
14	4	5	1	30	6	4	2
15	1	5	4	31	6	6	0
16	7	3	4	32	5	5	0

Post Meeting Reaction Q Sort

The purpose of this instrument is to ascertain which channel was given the greatest weight in the transactions of the dyads. It is expected that those dyads having compatibility among all three channels, $M \equiv M$, $D \equiv D$, $I \equiv I$, will weight information statements high-positive, work-emotionality items high-positive, and ego-stage items high-positive in that order. It is also expected that there will be a progressive trend toward high-negative in the order of rating ego-stage, work-emotionality, and information items as incompatibility increases toward incompatibility among all three channels, $M \not\equiv M$, $D \not\equiv D$, $I \not\equiv I$.

After the ½ hour discussion period, the members of the dyads will be given a deck of Q sort cards and written instructions. They will be asked to distribute the statements on the cards according to what they perceive best describes their dyad's activities. The statements as placed from right to left describe what the dyad was most like to what the dyad was least like. The exact number of statements per distribution pile appears on the instruction sheet accompanying the Q sort deck.

The instrument is composed of three sets of variables. These variables are as follows.

(1) Ego-Stage Items (n = 32)

There are 32 ego-stage items in order to include four examples for each of the eight ego-stages. There are two positive and two negative valence statements for each ego-stage.

An example of this variable's measurement is:

> "There was no doubt as to what roles each member perceived himself in."

(2) Work-Emotionality Items (n = 24)

There are 24 work-emotionality items in order to include each combination of work level with each type of emotionality. There are four levels of work and six types of emotionalities.

An example of this variable's measurement is:

> "During the meeting very little unity and warmth was shown between members."

(3) Information Exchange Items (n = 8)

There are eight information exchange items in order to include two samples of each of the four encoding-decoding behaviors.

An example of this variable's measurement is:

> "It was evident that not everything that was being said was being heard."

It can be readily perceived that to accept the tabulated scores would give unproportional values to ego stage items as compared to the other two variables. Work-emotionality would have a higher score than information exchange solely on the basis that there are 3 times as many items. To correct this condition and thus attempt to equalize the weighting, the investigator developed the following procedures.

First to establish new weights for each variable, the number of items for each variable is divided into the total number of items. Thus:

Ego Stage	64 - 32 = 2.00
Work-emotionality	64 - 24 = 2.67
Information exchange	64 - 8 = 8.00

The distribution and valence system for the Q sort is given below.

TABLE B-6

Value	0	1	2	3	4	5	6	7	8	
Frequency	2	4	7	12	14	12	7	4	2	(N = 64)

The following example of an individual's score is presented to illustrate the function of the weightings for each of the three variables.

TABLE B-7
RAW AND WEIGHTED SCORES ON THE PMRQ SORT
OF A SUBJECT

VARIABLES	RAW SCORES	WEIGHTINGS	WEIGHTED SCORES
Ego Stage	115	2.00	230
Work-emotionality	103	2.67	275
Information Exchanges	38	8.00	304

Information Test (Post Meeting)

It is hypothesized that there is a continuum of an open to a fairly closed communication system, that being from $M \equiv M$, $D \equiv D$, and $I \equiv I$, to $M \not\equiv M$, $D \not\equiv D$, and $I \not\equiv I$. It is predicted that more errors of perceiving origination of information source will be made as the continuum progresses to low congruency among all three channels. To gather data on this information the following means are employed.

The subjects are requested to write a brief but fairly comprehensive report on how his dyad perceived the problem and the solution or solutions that this dyad developed during their discussion. The subjects are given the following written instructions.

> "Please take the next 15 minutes to write a brief but comprehensive report on how your group developed insights into the nature of the problem and what could be done to resolve the problem."

The statements in the essay will be analyzed and scored for each member using the matrix form shown below. The horizontal categories refer to the perceptions taken from the Information Test. The vertical categories refer to the data which are taken from the video tape records. The cells are numbered and circled for reference purposes in the top right corner.

TABLE B-8

Video Tape Data	Information Test Data			
	Subject Perceived as Originator	Alter Perceived as Originator	Perceived Joint Authorship	No Originator Indicated
Statement made by subject	+ ①	- ⑤ 3	- ⑨	- ⑬
Statement made by alter	- ②	+ ⑥ 2	- ⑩	- ⑭
Statement jointly developed during discussion	- ③ 1	- ⑦	+ ⑪ 2	- ⑮
Statement not made	- ④	- ⑧ 1	- ⑫	+ ⑯ 1

Each time a subject identifies a point of information in his essay, a coder will classify it using the 4 information categories. The entire essay will be broken down into these 4 categories. Then each statement will be screened against the video tape recording. The statement will then be reclassified employing the 4 video tape categories.

For example, in a subject's essay he may identify himself as the originator of the information exchange. In subsequent screening using the video tape the statement was seen to have been originated by the alter. The coder will then tabulate one score in the cell number ②. In this like manner each statement made by the subjects will be compared and coded.

An illustrative set of scores are inserted in the table. It is to be noted that the cells marked by a plus sign (+) are those in which subject and coder are in agreement.

Observations of Ego-Stage Concerns

This instrument is to be used by three judges. It is designed to measure the valence and degree of ego-stage concern relationships between the members of each dyad. It is conjectured that there will be a positive correlation between compatibility on the M channels in the dyads and the degree to which there is a positive expression of ego-stage concerns between the two members.

For example, where trust-mistrust is expressed, the members having compatibility on the M channel would indicate a moderate to high degree of positive trust. Similarly with the other ego-stage concerns. Low compatibility on M. channels would result in a negative valence. That is, in relation to trust-mistrust we would expect a progressively high-negative valence toward mistrust.

The three judges will be asked to code the ego-stage concerns being expressed within each of the dyads. This will be done by viewing the video tape recordings made during each dyad's discussion. The coding is registered on a form identical to that shown in Table 11.

TABLE B-9
CODING FORM FOR EGO-STAGE CONCERNS

+		-
TRUST (high) (low)	No Evidence	MISTRUST (low) (high)
7 6 5 4 3 2 1	0	1 2 3 4 5 6 7
AUTONOMY		SHAME, DOUBT
7 6 5 4 3 2 1	0	1 2 3 4 5 6 7
INITIATIVE		GUILT
7 6 5 4 3 2 1	0	1 2 3 4 5 6 7
INDUSTRY		INFERIORITY
7 6 5 4 3 2 1	0	1 2 3 4 5 6 7
IDENTITY		ROLE DIFFUSION
7 6 5 4 3 2 1	0	1 2 3 4 5 6 7
INTIMACY		ISOLATION
7 6 5 4 3 2 1	0	1 2 3 4 5 6 7
GENERATIVITY		STAGNATION
7 6 5 4 3 2 1	0	1 2 3 4 5 6 7
INTEGRITY		DESPAIR
7 6 5 4 3 2 1	0	1 2 3 4 5 6 7

An example of coding procedures is as follows. Each judge views the video tape and finds perhaps no evidence of concern expressed concerning Generativity. Therefore, no evidence is recorded. But, much concern is being expressed regarding Autonomy. It might be expressed by each member in the dyad supporting the other member's right to act autonomously. This would be coded as positive Autonomy. If it appears to be highly supportive in practicing Autonomy, it might be coded Autonomy, 7 - positive.

In the event that the judges are in disagreement in their codings related to the degree of an ego-stage concern but still in agreement on the valence (positive, negative), a simple correlation could be designed to determine their variance. This would be done by weighting the existing scale on a fifteen point basis. The fifteen point basis is derived from adding the 7 point positive scale, 1 no evidence, and the 7 point negative scale. The weight 15 would be given high-positive, 7, and the weight 1 would be given high-negative, 7.

For example, if judge A coded an ego-stage concern 5 positive, judge B coded the same dyad's ego-stage concern 3 positive, and judge C coded the same example 2 positive, their transposed coding would be weighted scores 13,11, and 10. Tests of correlation would be applied to these weighted scores.

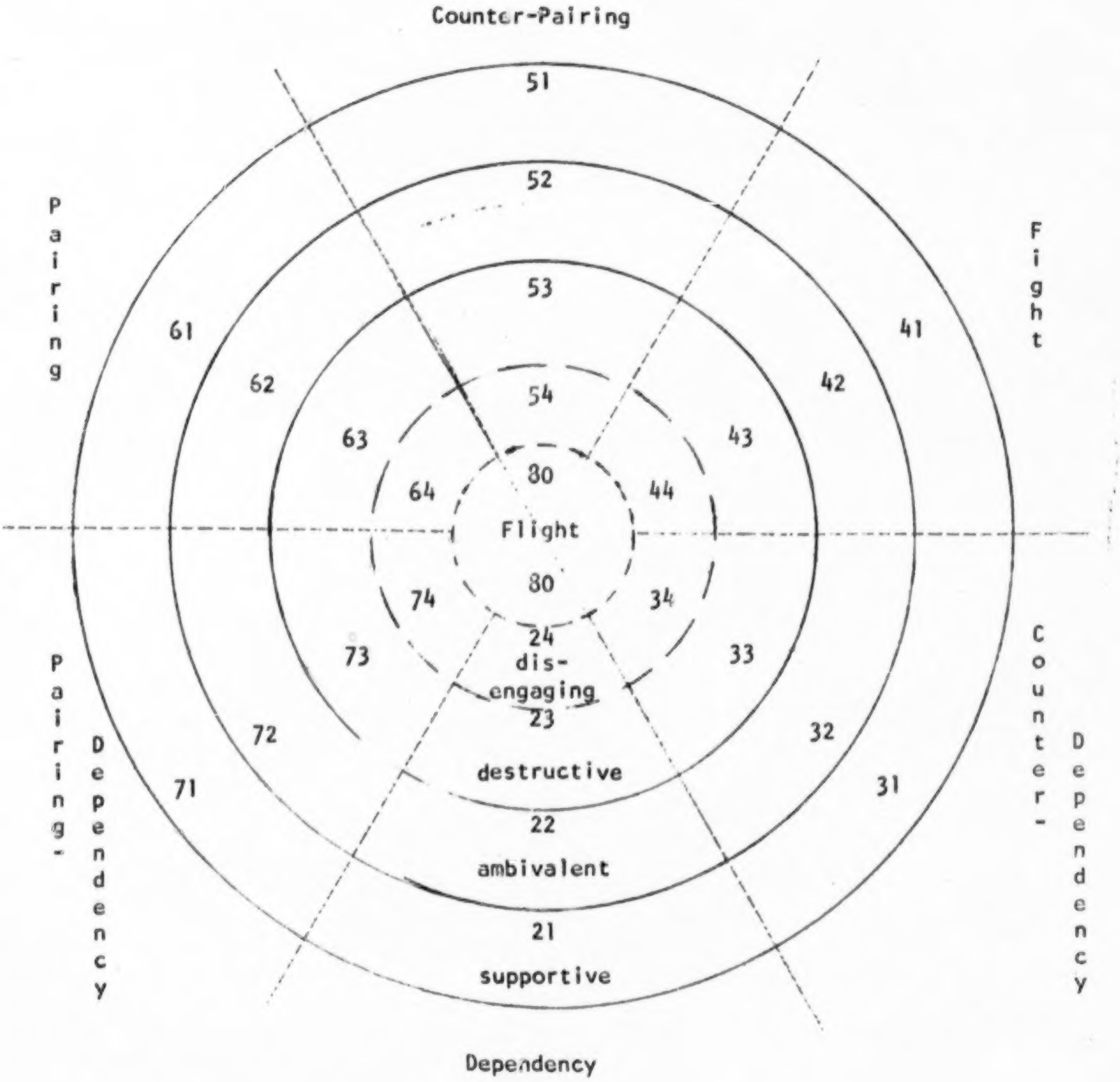
Observations of Emotionality

The video tape recordings are again employed by the set of three judges to code the behaviors of dyad members within the emotionality categories (emotional modalities).

The emotional modalities are explained in the Theoretical Frameworks section 1.22 under the Delivery Channel. Therein it was determined there are six emotional modalities and four levels of work. Figure 5 indicates more than six modalities. This conceptual diagram delineates more mixtures of the four basic categories Fight, Flight, Pairing, and Dependency.

This 'wheel' (Figure 5) might best be interpreted as follows: All the 1's and 2's, that is 21, 52, etc. are supportive type statements. The 3's and 4's that is 63, 34, etc. are non-supportive types of statements. All the different ten digits indicate different emotional modalities. These are indicated as Dependency, Fight, Flight, Pairing, and their mixtures. Therefore, if a statement (sentence) is perceived to be a Fight statement, non-supportive it would be coded 43, or 44. For example, "That was a stupid statement." This would be coded 43, non-supportive.

It is not necessary to examine the work aspect within this channel for this study. It may be useful at some time to hypothesize that the various dyads will have different work levels. This could be a very significant finding which could be pulled from the data at anytime. We might even be able to say that certain dyads will work better than other dyads due to their makeup of the three channels of communication. If resources within this study permit, this analysis will be done.



Counter-Pairing
51
52
53
54
80
Flight
80
24
dis-
engaging
23
destructive
22
ambivalent
21
supportive
Dependency
Pairing
61
62
63
64
Fight
41
42
43
44
74
73
72
71
Pairing-Dependency
34
33
32
31
Counter-Dependency

Figure 8-10
Emotional Modalities

The question before us at this time is: Are these people being supportive of each other or not supportive in their emotionality aspect of the work they happen to be doing at this time?

The mechanics of handling this coding is shown in the grids below. An illustrative set of hypothetical data is also supplied therein.

Judge #1

Subjects	Utterances						
1	1	2					
	21	41					
2	1	1	2				
	32	54	34				
1	1	2	3	4			
	51	44	32	21			
2							

Judge #2

Subjects	Utterances						
1	1	2					
	21	41					
2	1	1	2				
	31	54	32				
1	1	2	3	4			
	51	43	32	21			
2							

Judge #3

Subjects	Utterances							
1	1	2						
	21	42						
2	1	1	2					
	31	54	34					
1	1	2	3	4				
	51	43	32	22				
2								

Figure D-11
Charts for Coding Emotional Modalities

The purpose for doing this analysis is to say that those dyads which have delivery channels which are compatible will be more supportive in their actual transactions. That is, there will be in evidence more 1's and 2's than there will be of 3's and 4's. One's and 2's statements are supportive and 3's and 4's are non-supportive statements.

The above grids indicate that there is not complete agreement among judges as to the specific 'number' coded. A probability study could be readily made among the 3 judges to determine the degree of error. Remembering that 1's and 2's are both supportive, and 3's and 4's are non-supportive, we could say that judges are in agreement if they all indicate either supportive or non-supportive each. If however, one judge indicates non-supportive (3 or 4) and the others indicated supportive (1 or 2), they would all be requested to recode that section. This recoding would then be tested for agreement and in the event they were still not in agreement, the probability study would indicate an error.

APPENDIX C

COMPATIBILITY MEASURES FORMULAE

The Measure of Compatibility

Compatibility is defined as a property of a relation between two or more persons that leads to mutual satisfaction of interpersonal needs. There are three sub-measures which compose the measure of compatibility, namely the reciprocal measure, the conflictual measure, and the similarity measure.

The measure of compatibility is employed to establish the composition of the dyads. Compatibility scores are obtained for both the motivation dimension and the delivery dimension. The three sub-measures are explained and illustrated through a set of dummy data on the motivation profiles of two subjects. The compatibility formulae are then applied to a set of dummy data on the delivery profiles of two subjects. This material is illustrious only.[1]

1. The Reciprocal Measure (rK) is written in quantitative form in the following manner. Let e represent the LIKE-UNLIKE test. That is the instrument which describes what the subject perceives himself to be like. Let w represent the ALTER test. That is the instrument which describes who the subject would like to work with. The formula would be written:

   $$rK_{ij} = (w_i - e_j) + (w_j - e_i)$$

   The rationale for the formula rests on the relationship between whom one subject would like to work with (w_i) and the type of person with whom he is put to work (e_j). The less the difference the greater the reciprocal measure. The signs within the brackets are ignored when the product of the two parts are added.

2. The Conflictual Measure is written quantitatively as follows:

   $$fK_{ij} = (e_i - w_i) + (e_j - w_j)$$

   The signs within the brackets are ignored when the product of the two parts are added.

3. The Similarity Measure is written quantitatively as follows:

   $$sK_{ij} = (e_i - e_j) + (w_i - w_j)$$

   The signs within the brackets are ignored when the product of the two parts are added.

---

[1] The author is very much in debt to the work of Schutz (1960) in the development of compatibility measures.

Figure 8 illustrates the means by which a compatibility measure is procured for two subjects. An identical procedure is carried out for each combination of pairs of subjects. A computer is devised to handle the data and yield compatibility measures for all possible dyads.

The formulae for the compatibility measures on the delivery dimension are identical to those described above. Figure 9 illustrates the means by which a compatibility measure is procured for two subjects.

In all cases of establishing compatibility the smaller the CK (total compatibility measure) the greater the degree of compatibility.

		I		II		III		IV		V		VI		Vii		Viii	
		i	j	i	j	i	j	i	j	i	j	i	j	i	j	i	j
+	e	51	37	40	35	43	39	41	41	43	40	52	37	46	47	40	31
	w	25	31	29	31	26	32	24	35	29	34	36	33	33	44	20	30
-	e	46	46	46	39	43	37	44	37	46	38	47	40	50	41	50	40
	w	22	25	23	28	20	34	24	34	19	31	27	32	22	30	21	25

$$rK_{ij} = \left[(25 - 37) + (31 - 51)\right] + \left[(29 - 35) + (31 - 40)\right] \; . \; . \; . \; . \; \left[(21 - 40) + (25 - 50)\right] = \frac{\qquad}{16}$$

$$fK_{ij} = \left[(51 - 25) + (37 - 31)\right] + \left[(40 - 29) + (35 - 31)\right] \; . \; . \; . \; . \; \left[(50 - 21) + (40 - 25)\right] = \frac{\qquad}{16}$$

$$sK_{ij} = \left[(51 - 37) + (25 - 31)\right] + \left[(40 - 35) + (29 - 31)\right] \; . \; . \; . \; . \; \left[(50 - 40) + (21 - 25)\right] = \frac{\qquad}{16}$$

$$CK_{ij} = rK_{ij} + fK_{ij} + sK_{ij}$$

FIGURE C-1
CALCULATION OF COMPATIBILITY OF TWO SUBJECTS ON
M DIMENSION

$$rKij = \left[(15 - 18) + (20 - 16)\right] + \left[(13 - 18) + (12 - 12)\right] \ldots \left[(17 - 15) + (7 - 14)\right] = \frac{\qquad}{24}$$

$$fKij = \left[(16 - 15) + (1 - 20)\right] + \left[(12 - 13) + (18 - 12)\right] \ldots \left[(14 - 17) + (15 - 7)\right] = \frac{\qquad}{24}$$

$$sKij = \left[(16 - 18) + (15 - 20)\right] + \left[(12 - 18) + (13 - 12)\right] \ldots \left[(17 - 19) + (18 - 9)\right] = \frac{\qquad}{24}$$

$$CK = rKij + fKij + sKij$$

FIGURE C-2

CALCULATION OF COMPATIBILITY OF TWO SUBJECTS ON D DIMENSION

FIGURE C-3

SCORES OF TWO SUBJECTS EMPLOYED TO ESTABLISH LEVEL OF COMPATIBILITY ON WORK-EMOTIONALITY CATEGORIES

Work	Emotionality	F		FL		P		CP		D		CD	
Level	Subject	i	j	i	j	i	j	i	j	i	j	i	j
1	e	16	18	12	18	9	11	18	17	12	12	17	20
	w	15	20	13	12	11	15	19	11	11	15	21	10
2	e	13	14	16	21	16	16	18	19	12	15	13	6
	w	17	11	17	22	20	12	21	17	12	15	15	7
3	e	14	20	10	15	14	21	17	16	18	21	17	19
	w	17	20	12	11	16	12	19	12	10	19	18	9
4	e	15	17	19	17	16	19	11	12	17	13	14	15
	w	15	16	20	15	11	20	17	12	10	17	17	7

APPENDIX D

PHYSICAL DESIGN OF LABORATORY

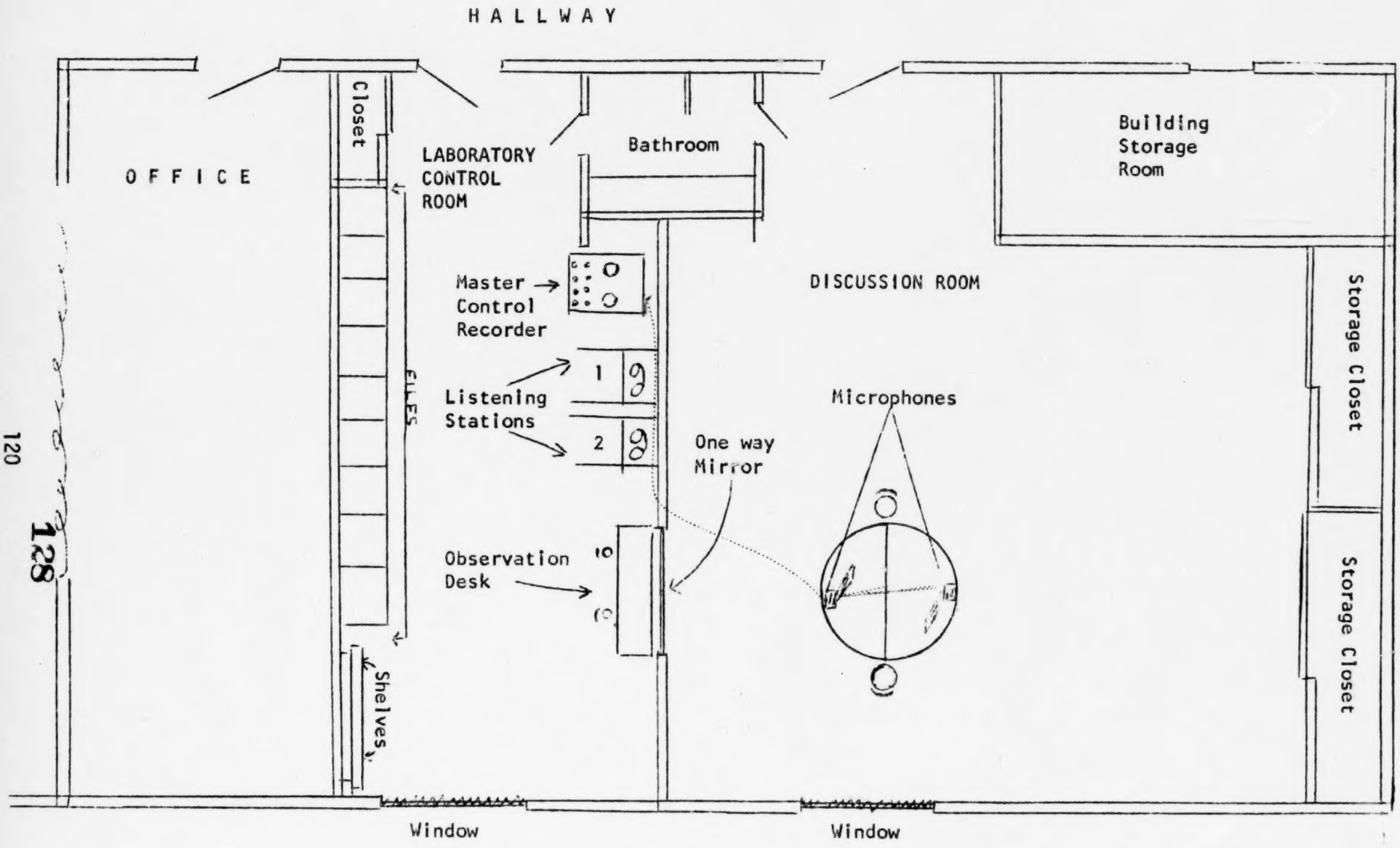

HALLWAY
OFFICE
Closet
LABORATORY CONTROL ROOM
Bathroom
Building Storage Room
DISCUSSION ROOM
Master Control Recorder
Listening Stations
1
2
FILES
Microphones
One way Mirror
Observation Desk
Shelves
Storage Closet
Storage Closet
Window
Window

FIGURE D-1
EXPERIMENTAL LABORATORY/DISCUSSION ROOM LAYOUT

APPENDIX E

RAW DATA REFERRED TO IN THE TEXT

TABLE E-1
PEARSON PRODUCT MOMENT r ON TEST OF REMEMBERING SCORES ON A PRE AND POST SEMANTIC DIFFERENTIAL*

SUBJECT NUMBER	CORRELATION (r)
109	.86
111	.92
104	.91
115	.89
105	1.00
114	.90

*There were 16 participants. A random sample of 6 results was selected as representative of the sample

TABLE E-2
RANK ORDER OF THE MEAN CORRELATIONS BY DYAD TYPE OF EXPECTED AND OBSERVED FROM THE SEMANTIC DIFFERENTIAL RESULTS

DYAD TYPE	MEAN CORRELATIONS	RANKING EXPECTED	RANKING OBSERVED
1	.803	1	2
2	.806	2	1
3	.676	3	7.5
4	.756	4	4
5	.689	5	6
6	.676	6	7.5
7	.799	7	3
8	.731	8	5

Kendall's Tau (τ) = .25
Significance level .05, with N = 8 is .19.

TABLE E-3
SUMMARY OF RANK ORDERING THE 3 CHANNELS FROM THE PMRQ SORT RAW DATA*

DYAD TYPE	TOTALS OF RANKINGS CULTURES	EMOTIONALITY	INFORMATION
1	24	24	12
2	22	28	10
3	24	20	16
4	26	24	10
5	24	26	10
6	20	28	12
7	26	24	10
8	27	23	10

* The actual raw data is available from the Adult Instructional Laboratory, the University of Wisconsin, Madison.

** It should be kept in mind that these scores are totals of rankings 1, 2 or 3 by the 10 individuals in the dyad type. Therefore, if everyone (all 10) had ranked one channel first the cumulative total would be 10. If all had ranked another channel second, the total would be 20. Finally were they all to rank one channel third the total would be 30.

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